HP EliteBook 2760p Tablet PC

Maintenance and Service Guide

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Safety warning notice

⚠ **WARNING!** To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

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1 Product description

Category	Description
Product name	**HP EliteBook 2760p Tablet PC**
Processors	**Intel® 2nd Generation Core™ i7 processors** (soldered to system board)
	i7-2620M, 2.7-GHz (turbo up to 3.4-GHz) Dual-Core processor, 4 MB L3 cache, 35W
	Intel 2nd Generation Core i5 processors (soldered to system board)
	i5-2410M, 2.3-GHz (turbo up to 2.9-GHz) Dual-Core processor, 3 MB L3 cache, 35W (select models only)
	i5-2520M, 2.5-GHz (turbo up to 3.2-GHz) Dual-Core processor, 3 MB L3 cache, 35W
	i5-2540M, 2.6-GHz (turbo up to 3.3-GHz) Dual-Core processor, 3-MB L3 cache
Chipset	Mobile Intel QM67 Express Chipset
Graphics	Intel HD Graphics 3000
	Integrated with shared video memory
	Supports dual-display ports through the dock
Panel	**30.7-cm** (12.1-in) Illumi-Lite WXGA UWVA (1280x800) with digitizer pen and/or multi-touch
	30.7-cm (12.1-in) Illumi-Lite WXGA UWVA outdoor view (1280x800) with digitizer pen and/or multi-touch
	Chemically-strengthened glass top cover
Memory	Two customer-accessible/upgradeable memory module slots
	Supports dual-channel memory
	Supports up to 16 GB of PC3 10600, 1333 MHz, DDR3 system RAM (running at 1066 MHz)
	Supports the following configurations: • 16384 MB total system memory (8192 MB x 2) • 12288 MB total system memory (8192 MB + 4096 MB) • 8192 MB total system memory (4096 MB x 2) • 8192 MB total system memory (8192 MB x 1) • 6144 MB total system memory (4096 MB + 2048 MB) • 4096 MB total system memory (2048 MB × 2) • 4096 MB total system memory (4096 MB × 1) • 3072 MB total system memory (2048 MB + 1024 MB) • 2048 MB total system memory (2048 MB × 1)

Category	Description
Hard drives	Supports **7-mm** (2.5 in) hard drives
	Customer-accessible
	Supports the following SATA drives: • 500 GB, 7200 rpm hard drive • 320 GB, 7200 rpm hard drive • 320 GB SED, 7200 rpm hard drive • 250 GB, 7200 rpm hard drive
	Supports the following solid-state drives: • 256 GB • 160 GB • 128 GB
Audio/Visual	Integrated dual-array microphone
	High-definition (HD) audio with SRS premium sound
	Stereo speakers (2)
	720p webcam
Modem	56K V.92 MDC data/fax modem
	Modem cable not included
	Supports “no modem” option
Ethernet	Intel 82579LM Gigabit Network Connection 10/100/1000 network interface card (NIC) with iAMT
	S3/S4/S5 wake on LAN
	NIC power-down technology
	Ethernet cable not included
Wireless	**Integrated wireless local area network (WLAN) options by way of the following wireless modules:**
	Supports the following WLAN formats: • Broadcom 4313GN 802.11b/g/n 1x1 WiFi Adapter • Broadcom 43224 AGN 802.11a/b/g/n 2x2 WiFi Adapter • Intel Centrino® Advanced-N 6205 802.11a/b/g/n
	Supports “no WLAN” option
	Two WLAN antennas built into display assembly
	Integrated WWAN options by way of wireless module:
	Two WWAN antennas (world-wide 5-band) built into display assembly
	Supports "no WWAN" option

Category	Description
	Subscriber identity module (SIM) security (customer-accessible in battery bay)
	Qualcom 3000 HSPA/CDMA with GPS support (select models only), (not available in China)
	Ericsson 5521 HSPA+ (Sonic)
	Integrated wireless personal area network (WPAN) options by way of 2.1 Bluetooth® module:
	Supports “no WPAN” option
	Broadcom Bluetooth
External media card	ExpressCard **34 mm**
	Digital Media Reader Slot, supporting the following optional formats: • Secure Digital (SD) Memory Card • MultiMediaCard (MMC)
Ports	Audio-in/audio out (stereo headphone/microphone combination)
	RJ-11 (modem)
	RJ-45 (Ethernet, includes link and activity lights)
	USB 2.0 (3), one powered/charging
	VGA (Dsub 15-pin)
	1394a
	Multipin AC power
	Docking connector
	SD slot
	Travel battery connector
Docking	For HP 2740p Ultra-Slim Expansion Base
Keyboard	Full-size keyboard
	Dual point
	Spill-resistant design, DuraKey coating
	TouchPad supports: • 2-way scroll • Taps enabled as default • 2-Finger Scrolling, 2-Finger Zoom (Pinch) gestures enabled by default
	Digital eraser pen with tether
Power requirements	AC adapter with localized cable plug support (3-wire plug with ground pin):
	65W Smart AC adapter RC V 3W
	65W Smart AC adapter RC V EM 3W

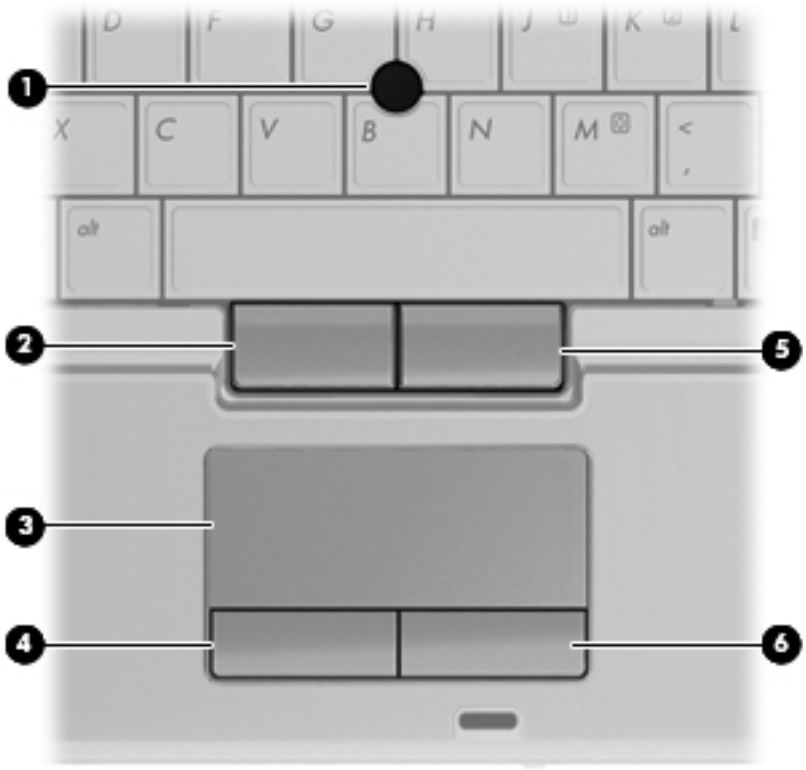
Category	Description
	65W travel AC adapter
	Support for the following batteries:
	6-cell, 2.0 Ah (44 Whr) Li-ion battery with fuel gauge LEDs
	6-cell, 2.0 Ah (39 Whr) Li-ion Long Life battery (select models only)
	Supports optional HP2700 Ultra-Slim Battery
	HP Fast Charge Technology
Security	Integrated fingerprint reader
	Integrated smart card reader (active) Alcor AU9540
	Supports security lock
	Trusted platform module (TPM) V.1.2
	Preboot authentication (password, smart card)
	HP ProtectTools
	HP Power Assistant
Operating system	**Preinstalled:**
	Windows 7 Professional 64 (U.S., Canada, and Japan only)
	Windows 7 Professional 32 (U.S., Canada, and Japan only)
	Windows 7 Home Premium 64 (U.S., Canada, and Japan only)
	Windows 7 Home Premium 32 (U.S., Canada, and Japan only)
	FreeDOS
	Preinstalled with Microsoft® Office:
	Windows 7 Professional 32 or 64 with Microsoft® Office 2010 Personal (Japan only)
	Windows 7 Professional 32 or 64 with Microsoft Office 2010 Professional (Japan only)
	Windows 7 Professional 32 or 64 with Microsoft Office 2010 Home and Business (Japan only)
	Windows 7 Professional 32 or 64 with Microsoft Office 2010 Starter (excludes Japan)
	Windows 7 Home Premium 32 or 64 with Microsoft Office 2010 Personal (Japan only)
	Windows 7 Home Premium 32 or 64 with Microsoft Office 2010 Professional (Japan only)
	Windows 7 Home Premium 32 or 64 with Microsoft Office 2010 Home and Business (Japan only)
	Windows 7 Home Premium 32 or 64 with Microsoft Office 2010 Starter (excludes Japan)
	Restore Media:
	Windows 7 Professional 32 or 64
	Windows 7 Home Premium 32 or 64

Category	Description
	DRDVD Windows 7
	Web-only support:
	Windows XP Professional 32
	Windows XP Tablet Edition
	Windows Vista Business 32 or 64
	Windows Vista Enterprise 32 or 64
	Windows 7 Enterprise 32 or 64
	Windows 7 Ultimate 32 or 64
	Certified:
	Microsoft WHQL
	Novell
	SuSE Linux
Serviceability	**End-user replaceable parts:**
	AC adapter
	Battery
	Hard drive
	Memory module
	WLAN module
	WWAN module

2 External component identification

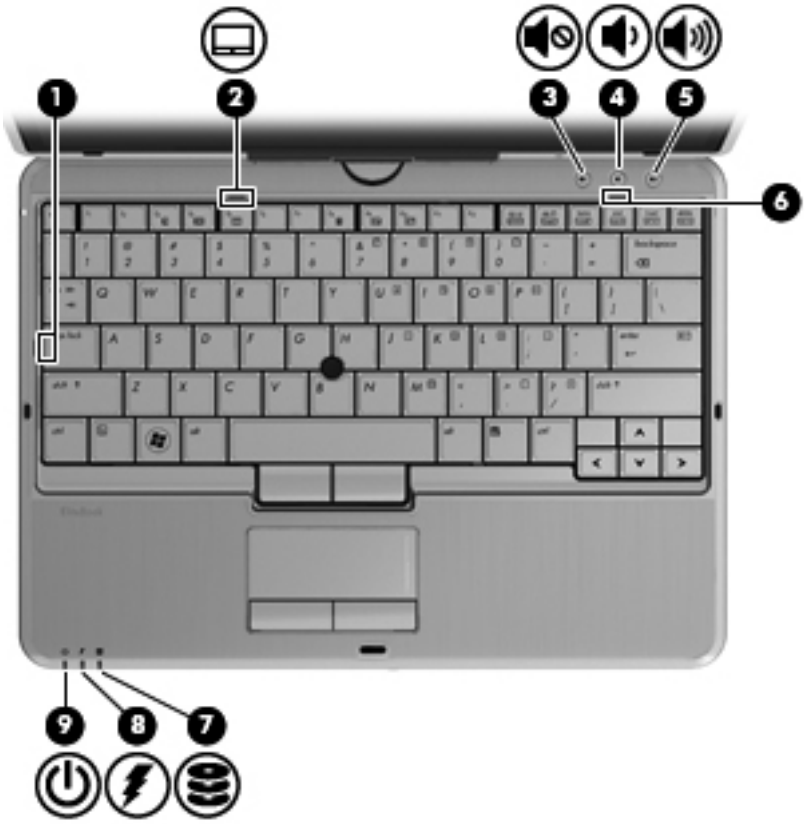
Top

TouchPad



Component		Description
(1)	Pointing stick	Moves the pointer and selects or activates items on the screen.
(2)	Left pointing stick button	Functions like the left button on an external mouse.
(3)	TouchPad	Moves the pointer and selects or activates items on the screen.
(4)	Left TouchPad button	Functions like the left button on an external mouse.
(5)	Right pointing stick button	Functions like the right button on an external mouse.
(6)	Right TouchPad button	Functions like the right button on an external mouse.

Lights



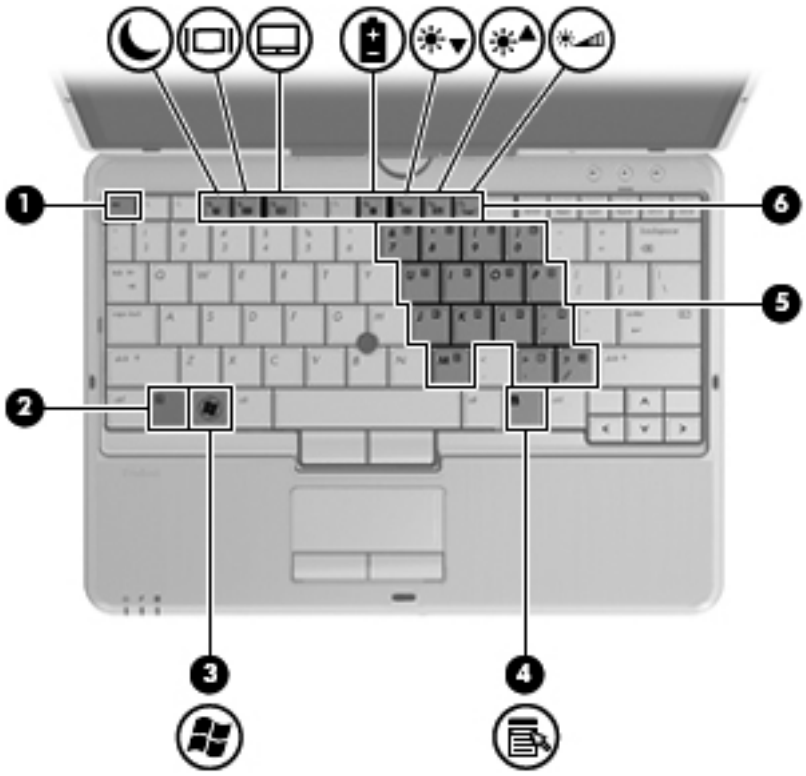
Component		Description
(1)	Caps lock light	On: Caps lock is on.
(2)	TouchPad light	• Off: TouchPad is on. • Amber: TouchPad is off.
(3)	Mute light	• White: Computer sound is on. • Amber: Computer sound is off.
(4)	Volume down light	White: The computer volume is being decreased.
(5)	Volume up light	White: The computer volume is being increased.
(6)	Num lock light	On: Num lock is on and the embedded numeric keypad is enabled.
(7)	Drive light	• White: The hard drive or optical drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the hard drive.

Component		Description
(8)	Battery light	• White: A battery is close to full charge capacity. • Amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. • Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(9)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state. • Off: The computer is off or in Hibernation.

Buttons

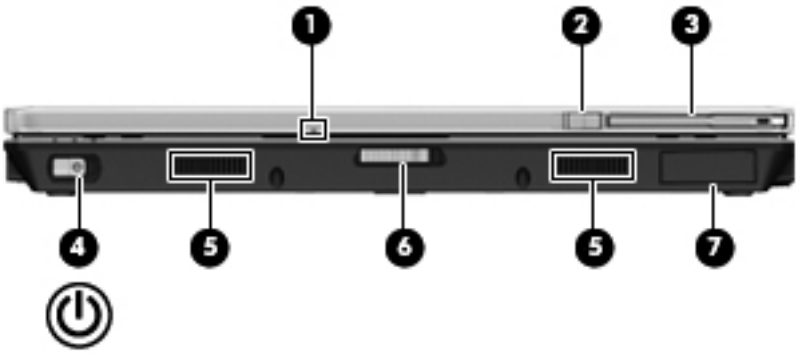
Component		Description
(1)	Volume mute button	Mutes and restores speaker sound.
(2)	Volume down button	Decreases computer volume.
(3)	Volume up button	Increases computer volume.

Keys



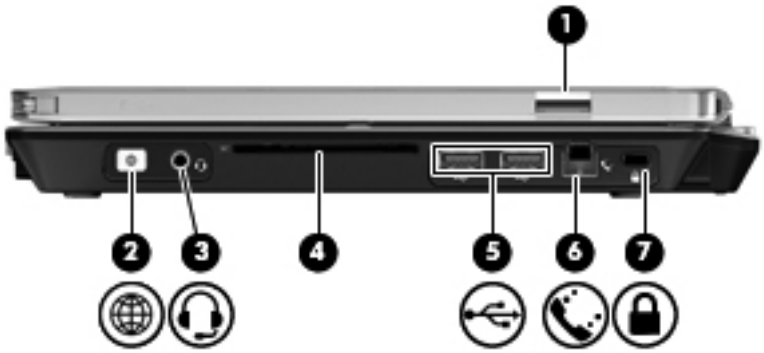
Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key, the num lk key, or the esc key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Windows applications key	Displays a shortcut menu for items beneath the pointer.
(5)	Embedded numeric keypad keys	Can be used like the keys on an external numeric keypad when the embedded numeric keypad is turned on.
(6)	Function keys	Execute frequently used system functions when pressed in combination with the fn key.

Front



Component		Description
(1)	Webcam light	On: The webcam is in use.
(2)	External WWAN antenna button	Opens the external wireless wide area network (WWAN) antenna.
(3)	External WWAN antenna	Send and receive wireless signals to communicate with wireless wide-area networks (WWAN).
(4)	Power switch	• When the computer is off, slide the switch to the right to turn on the computer. • When the computer is on, slide the switch to the right to shut down the computer. • When the computer is in the Sleep state, slide the switch to the right briefly to exit Sleep. • When the computer is in Hibernation, slide the switch to the right briefly to exit Hibernation. If the computer has stopped responding and Windows shutdown procedures are ineffective, slide the switch to the right and hold for at least 5 seconds to turn off the computer. To learn more about your power settings, select **Start > Control Panel > System and Security > Power Options**.
(5)	Speakers (2)	Produce sound.
(6)	Display release latch	Opens the computer.
(7)	Bluetooth® compartment	Contains an optional Bluetooth device.

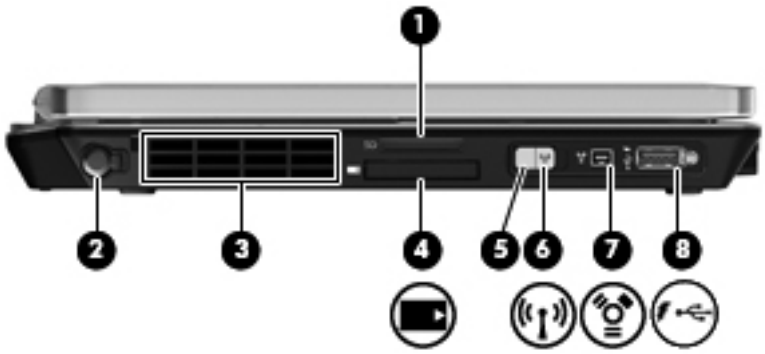
Right



Component		Description
(1)	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows instead of a password logon.
(2)	QuickWeb button	• When the computer is off or in Hibernation, press the button to open HP QuickWeb. • When the computer is in Microsoft Windows, press the button to open the default Web browser. • When the computer is in HP QuickWeb, press the button to open the default Web browser. **NOTE:** For more information, refer to "HP QuickWeb" in this guide and to the HP QuickWeb software Help. If your computer does not have HP QuickWeb software, the button does not perform any action or function.
(3)	Audio-out (headphone) jack/Audio-in (microphone) jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or television audio. Also connects an optional headset microphone. **WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*. **NOTE:** When a device is connected to the jack, the computer speakers are disabled. **NOTE:** A 4–conductor audio plug headphone with microphone is needed in order to use the microphone function.
(4)	Smart card reader	Supports optional smart cards and Java™ Cards.
(5)	USB 2.0 ports (2)	Connect optional USB devices.

Component		Description
(6)	RJ-11 (modem) jack (select models only)	Connects a modem cable.
(7)	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

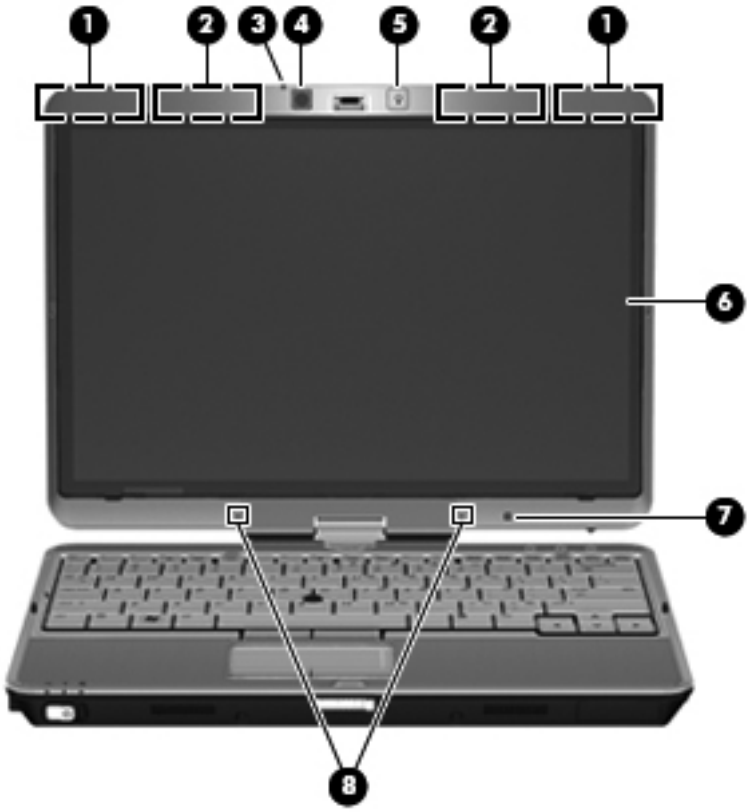
Left



Component		Description
(1)	Media Card Reader	Supports the following digital card formats: • MultiMediaCard • Secure Digital (SD) Card
(2)	Pen holder	Stores the digitizer pen.
(3)	Vent	Enables airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)	ExpressCard slot (select models only)	Supports optional ExpressCards.
(5)	Wireless light	• White: An integrated wireless device, such as a wireless local area network (WLAN) device, the HP Mobile Broadband Module, and/or a Bluetooth device, is on. • Amber: All wireless devices are off.
(6)	Wireless switch	Turns the wireless feature on or off, but does not create a wireless connection. **NOTE:** A wireless network must be set up in order to establish a wireless connection.

Component		Description
(7)	1394 port	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.
(8)	USB charging port	Provides power to a USB device, such as an optional external MultiBay, if used with a powered USB cable.

Display

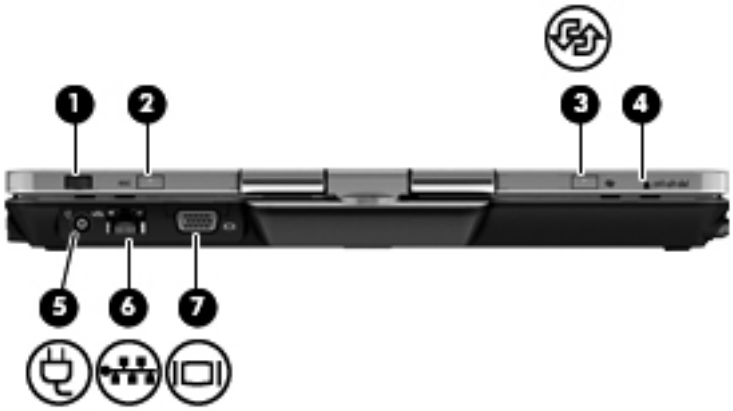


Component		Description
(1)	WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless wide-area networks (WWAN).
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).
(3)	Webcam light	On: The webcam is in use.
(4)	Webcam	Records video and captures still photographs. To use the webcam, select **Start > All Programs > HP > HP Webcam**.
(5)	Keyboard light button	Opens and turns on the keyboard light.

Component		Description
(6)	Touch screen	Allows you to perform certain actions using your fingers or the digitizer pen.
(7)	Ambient light sensor	Automatically adjusts the display brightness based on the lighting conditions in your environment.
(8)	Internal microphones (2)	Record sound.

*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. To see wireless regulatory notices, refer to the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region. These notices are located in Help and Support.

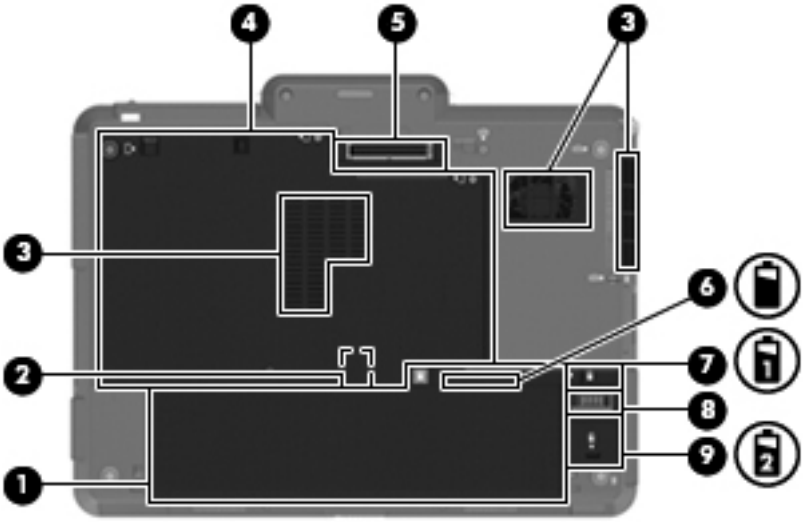
Rear



Component			Description
(1)		Jog dial	In slate mode, functions like the enter key and the up and down arrows on a standard keyboard. • Press inward to enter a command. • Rotate up to scroll up. • Rotate down to scroll down.
(2)		esc button	In slate mode, allows you to exit or escape out of an application.
(3)		Rotate button	In slate mode, switches the image between landscape and portrait orientation.
(4)		ctrl+alt+del button*	In slate mode: • While Windows is running, press the button with the pen to enter the ctrl+alt+del command.* • While the Computer Setup utility is running, press the button with the pen to enter the reset command. The computer resets and all unsaved information is lost. The reset function can be used to restore functionality when the system has become unresponsive.
(5)		Power connector	Connects an AC adapter.
(6)		RJ-45 (network) jack	Connects a network cable.
(7)		External monitor port	Connects an external VGA monitor or projector.

*To protect your work and the system, the ctrl+alt+delete command cannot be entered using the ctrl, alt, and del keys on the on-screen keyboard.

Bottom

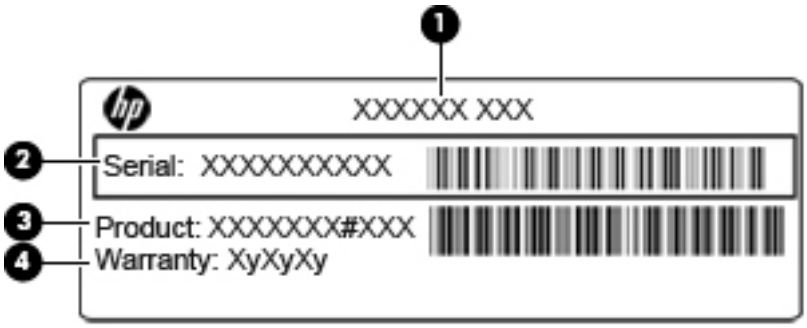


Component		Description
(1)	Battery bay	Holds the battery.
(2)	SIM slot	Supports a wireless subscriber identity module (SIM). The SIM slot is located inside the battery bay.
(3)	Vents (3)	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)	Hard drive bay	Contains the hard drive, the wireless LAN module slot, the WWAN module slot, and the memory module slot. **CAUTION:** To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.
(5)	Docking connector	Connects an optional docking device.
(6)	Charge level indicator	Displays the approximate remaining battery charge.
(7)	Battery release latch	Releases the battery from the battery bay.
(8)	Accessory battery connector	Connects an optional accessory battery.
(9)	Accessory battery connector door	Slides open to expose the accessory battery connector.

3 Illustrated parts catalog

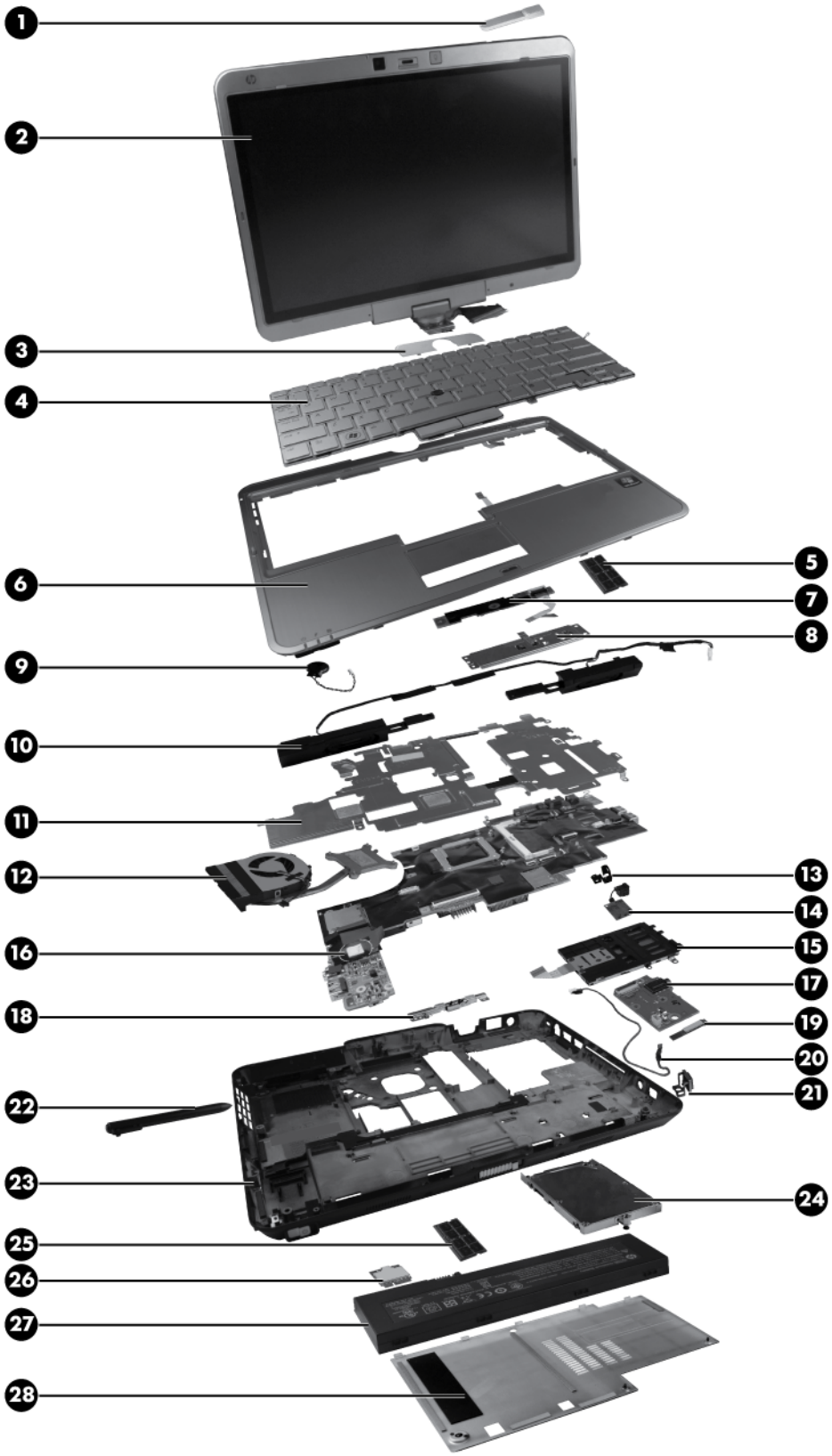
Serial number label location

When ordering parts or requesting information, the serial number label, located inside the battery bay, provides important information that you may need when contacting technical support.



	Component	Description
(1)	Product name	The product name affixed to the front of your computer.
(2)	Serial number	An alphanumeric identifier that is unique to each product.
(3)	Product part number	The identifier that provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
(4)	Warranty	The duration of the warranty period for this computer.

Computer major components



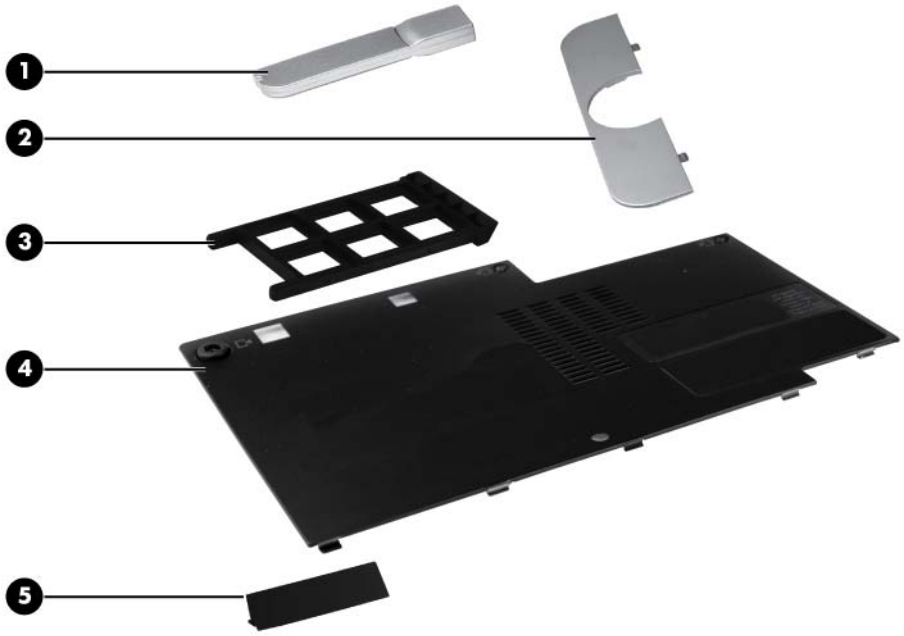
Item	Description	Spare part number
(1)	**External antenna**	657835-001
(2)	**Display assembly** (includes 2 WLAN antenna transceivers and cables and 2 WWAN antenna transceivers and cables)	
	30.7 cm (12.1 in) WXGA, LED, AntiGlare touch screen display	649753-001
	30.7 cm (12.1 in) WXGA, LED, AntiGlare touch screen display for use outdoors	649754-001
(3)	**Hinge cover assembly** (included in the Plastics Kit, spare part number 649764-001)	
(4)	**Keyboard with TouchPad and pointing stick** (includes buttons and cables)	
	For use in Belgium	649756-A41
	For use in Brazil	649756-201
	For use in Bulgaria	649756-261
	For use in the Czech Republic	649756-A81
	For use in Denmark	649756-081
	For use in Denmark, Finland, Norway, and Sweden	649756-DH1
	For use in France	649756-051
	For use in French Canada	649756-121
	For use in Germany	649756-041
	For use in Greece	649756-DJ1
	For use in Hungary	649756-211
	For use in Iceland	649756-DD1
	For use internationally	649756-B31
	For use in Israel	649756-BB1
	For use in Italy	649756-061
	For use in Japan	649756-291
	For use in Latin America	649756-161
	For use in Northwest Africa	649756-DW1
	For use in Norway	649756-091
	For use in Portugal	649756-131
	For use in Russia	649756-251
	For use in Saudi Arabia	649756-171
	For use in Slovakia	649756-A81
	For use in South Korea	649756-AD1
	For use in Spain	649756-071

Item	Description	Spare part number
	For use in Sweden and Finland	649756-B71
	For use in Switzerland	649756-BG1
	For use in Taiwan	649756-AB1
	For use in Thailand	649756-281
	For use in Turkey	649756-141
	For use in the United Kingdom	649756-031
	For use in the United States	649756-001
(5)	**Memory modules** (PC3-10600, 1333-MHz, DDR3)	
	8-GB	634091-001
	4-GB	621569-001
	2-GB	621565-001
(6)	**Top cover assembly** (includes TouchPad board, QuickWeb button, and capacitive board)	649768-001
(7)	**TouchPad button board** (included with the top cover assembly 649768-001)	
(8)	**TouchPad button board bracket** (included with the top cover assembly 649768-001)	
(9)	**RTC battery**	649769-001
(10)	**Speaker assembly**	649767-001
(11)	**System board shield** (includes replacement thermal material)	649760-001
(12)	**Fan/heat sink assembly** (includes replacement thermal material)	649759-001
(13)	**Security lock**	
(14)	**Modem module 56k, v.92 MDC 1.5 Guzzi F data/fax, for use in all countries** **NOTE:** The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 649758-001. See Cable Kit on page 25 for more Cable Kit spare part number information.	628824-001
(15)	**Smart card reader**	597839-001
(16)	**System board** (includes replacement thermal material)	
	For use in all countries and regions except Russia and the People's Republic of China:	
	• Equipped with Second Generation Intel Core i5-2410M Dual-Core processor [2.3 GHz (turbo up to 2.9 GHz), 3 MB L3 cache]	649745-001
	• Equipped with Second Generation Intel Core i5-2520M Dual-Core processor [2.5 GHz (turbo up to 3.2 GHz), 3 MB L3 cache]	649746-001
	• Equipped with Second Generation Intel Core i5 2540M Dual-Core processor [2.6 GHz (turbo up to 3.3 GHz), 3 MB L3 cache]	649747-001

Item	Description	Spare part number
	• Equipped with Second Generation Intel Core i7-2620M Dual-Core processor [2.7 GHz (turbo up to 3.4 GHz), 4 MB L3 cache]	649748-001
	For use only in Russia and the People's Republic of China:	
	• Equipped with Second Generation Intel Core i5-2410M Dual-Core processor [2.3 GHz (turbo up to 2.9 GHz), 3 MB L3 cache]	649749-001
	• Equipped with Second Generation Intel Core i5-2520M Dual-Core processor [2.5 GHz (turbo up to 3.2 GHz), 3 MB L3 cache]	649750-001
	• Equipped with Second Generation Intel Core i5-2540M Dual-Core processor [2.6-GHz (turbo up to 3.3 GHz), 3 MB L3 cache]	649751-001
	• Equipped with Second Generation Intel Core i7-2620M Dual-Core processor [2.7 GHz (turbo up to 3.4 GHz), 4 MB L3 cache]	649752-001
(17)	**Audio connector board**	649762-001
(18)	**Latch Kit**	597837-001
(19)	**Bluetooth module** **NOTE:** The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 649758-001. See Cable Kit on page 25 for more Cable Kit spare part number information.	537921-001
(20)	**Bluetooth cable** (included in the Cable Kit, spare part number 649758-001)	
(21)	**QuickWeb button** (included in the top cover assembly, spare part number 649768-001)	
(22)	**Pen** (includes tether)	606899-001
(23)	**Base enclosure** (includes latch)	649757-001
	WWAN modules (not illustrated)	
	Ericsson 5521 HSPA+ WWAN	632155-001
	Qualcomm Gobi 3000 HSPA/CDMA WWAN module with GPS (not available in China)	634400-001
(24)	**Hard drive** (includes bracket)	
	320 GB, 7200 rpm, SATA **7 mm** (2.5 in) self-encrypting drive (SED)	656621-001
	320 GB, 7200 rpm, SATA **7 mm** (2.5 in)	656620-001
	250 GB, 7200 rpm, SATA **7 mm** (2.5 in)	656619-001
	128 GB solid-state drive	653017-001
	160 GB solid-state drive	653018-001
(25)	**Memory module** (PC3-10600, 1333-MHz, DDR3)	
	8 GB	634091-001
	4 GB	621569-001
	2 GB	621565-001

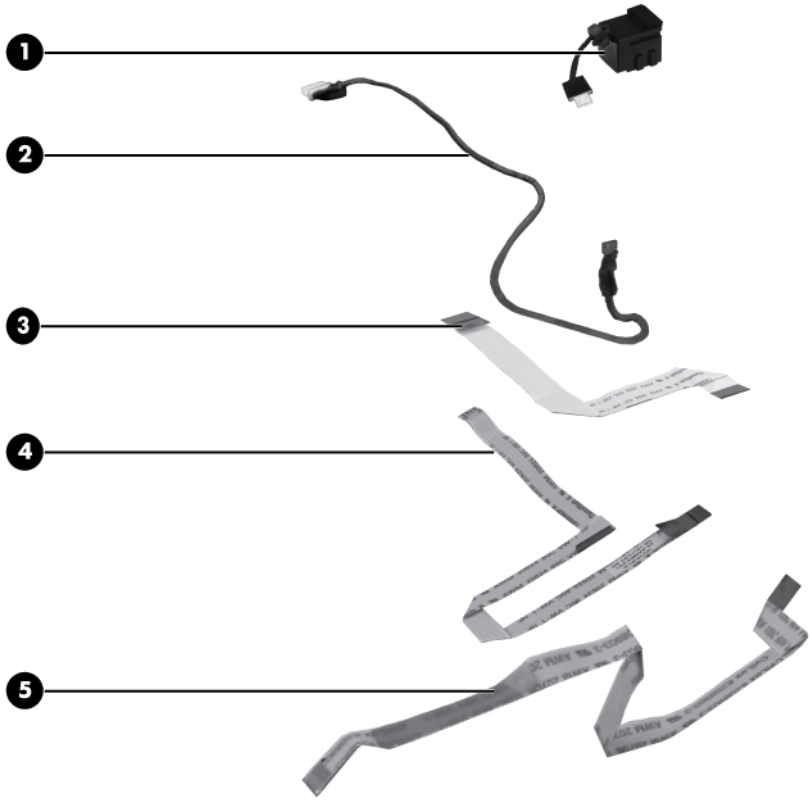
Item	Description	Spare part number
	1 GB	639738-001
(26)	**WLAN module**	
	Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter	
	• For use in North America and Latin America	582564-001
	• For use in Europe and Asia	582564-002
	Broadcom 4313GN 802.11b/g/n 1x1 WiFi Adapter	593836-001
	Intel Centrino Advanced-N 6205 a/b/g/n	631954-001
(27)	**Li-ion battery** (with charging indicator)	
	6-cell, 39 Whr, 2.0-Ah	454668-001
	6-cell, 44 Whr, 2.0-Ah	593592-001
(28)	**Service access cover** (included in the Plastics Kit, spare part number 649764-001)	

Plastics Kit



Item	Description	Spare part number
	Plastics Kit	649764-001
(1)	VGA bracket	
(2)	Display hinge cover	
(3)	ExpressCard slot protective insert	
(4)	Service access cover	
(5)	RJ11 door	

Cable Kit



Item	Description	Spare part number
	Cable Kit	649758-001
(1)	RJ-11 connector cable	
(2)	Bluetooth module cable	
(3)	Audio cable	
(4)	TouchPad connector cable	
(5)	Volume connector cable	

Mass storage devices

Description	Spare part number
Hard drives (includes bracket)	
320 GB SED, 7200 rpm, **7 mm** (2.5 in)	656621-001
320 GB, 7200 rpm, **7 mm** (2.5 in)	656620-001
250 GB, 7200 rpm, **7 mm** (2.5 in)	656619-001
128 GB solid-state drive (SSD)	653017-001
160 GB SSD	653018-001

Miscellaneous parts

Description	Spare part number
AC adapter	
65W AC travel adapter (for use only in Japan)	592814-001
65W Smart AC adapter, RC V, 3W	609939-001
65W Smart AC adapter, RC V, EM. 3W	609948-001
Rubber Kit (includes feet)	649765-001
HP 2740 Ultra-Slim Expansion Base	606172-001
Power cords	
For use in Argentina	490371-D01
For use in Australia	490371-011
For use in Brazil	490371-202
For use in Europe, the Middle East, and Africa	490371-021
For use in India	490371-D61
For use in Israel	490371-BB1
For use in Italy	490371-061
For use in Japan	490371-291
For use in the People's Republic of China	490371-AA1
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in Thailand	490371-201
For use in the United Kingdom and Singapore	490371-031

Description	Spare part number
For use in the United States	490371-001
Screw Kit • Phillips 2.5×8.0 captive screw • Phillips 2.0×7.0 captive screw • Phillips 2.0×3.0 captive screw • Phillips 3.0×2.5 screw • Phillips 2.5×3.0 screw • Phillips 2.5×6.0 screw • Phillips 2.0×4.0 screw • Phillips 2.0×3.5 screw • Phillips 2.0×3.0 screw • Phillips 2.0×2.0 screw • Phillips 1.5×1.5 Panhead screw • Torx 8M2.2×7.0 screw • Torx 8M2.2×5.0 screw	649766-001

Sequential part number listing

Spare part number	Description
454668-001	6-cell, 39 Whr, 2.0 Ah, Li-ion battery (with charging indicator)
490371-001	Power cord for use in North America
490371-011	Power cord for use in Australia
490371-021	Power cord for use in Europe, the Middle East, and Africa
490371-031	Power cord for use in the United Kingdom and Singapore
490371-061	Power cord for use in Italy
490371-111	Power cord for use in Switzerland
490371-201	Power cord for use in Thailand
490371-202	Power cord for use in Brazil
490371-291	Power cord for use in Japan
490371-AA1	Power cord for use in the People's Republic of China
490371-AB1	Power cord for use in Taiwan
490371-AD1	Power cord for use in Korea
490371-AR1	Power cord for use in South Africa
490371-BB1	Power cord for use in Israel
490371-D01	Power cord for use in Argentina
490371-D61	Power cord for use in India
537921-001	Bluetooth module (The Bluetooth cable is included in the Cable Kit, spare part number 649758-001.)
582564-001	Broadcom 43224 802.11 a/b/g/n 2x2 WiFi Adapter: For use in Antigua and Barbuda, Argentina, Aruba, the Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, the British Virgin Islands, Canada, Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, French Guiana, Grenada, Guadeloupe, Guam, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, the Nether Antilles, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, the United States, Uruguay, U.S. Virgin Islands, and Venezuela
582564-002	Broadcom 43224 802.11 a/b/g/n 2x2 WiFi Adapter: For use in Albania, Algeria, Angola, Australia, Austria, Bahrain, Bangladesh, Belarus, Belgium, Benin, Botswana, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, the People's Republic of China, the Congo, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Egypt, Equatorial Guinea, Estonia, Finland, France, Gabon, Gambia, Germany, Ghana, Gibraltar, Greece, Guinea, Guinea-Bissau, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Japan, Jordan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Liberia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Mali, Mauritania, Mauritius, Montenegro, Morocco, Mozambique, Namibia, Nepal, the Netherlands, New Zealand, Niger, Nigeria, Norway, Oman, Pakistan, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Switzerland, Syria, Taiwan, Tanzania, Thailand, Togo, Tunisia, Turkey, the United Arab Emirates, the United Kingdom, Vietnam, Yemen, and Zimbabwe

Spare part number	Description
592814-001	65W AC travel Adapter (for use in Japan)
593592-001	6-cell, 44 Whr, 2.0 Ah, Li-ion battery (with charging indicator)
593836-001	Broadcom 4313AGN 802.11a/b/g/n 1x1 Adapter: For use in Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bolivia, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Cayman Islands, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, the Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Finland, France, French Guiana, Gabon, Gambia, Germany, Ghana, Gibraltar, Greece, Grenada, Guinea, Guadeloupe, Guam. Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Liberia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Mali, Martinique, Mauritania, Mauritius, Mexico, Montenegro, Morocco, Mozambique, Namibia, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, Switzerland, Syria, Taiwan, Tanzania, Thailand, Togo, Tunisia, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, U.S. Virgin Islands, Venezuela, Vietnam, Yemen, and Zimbabwe
597837-001	Latch Kit
597839-001	Smart card reader
606172-001	HP 2740 Ultra-Slim Expansion Base
606899-001	Pen (includes tether)
609939-001	65W AC Smart Adapter, RC V, 3W
609948-001	65W AC Smart Adapter, RC V, EM 3W
621565-001	2 GB memory module (PC3-10600, 1333 MHz, DDR3, shared)
621569-001	4 GB memory module (PC3-10600, 1333 MHz, DDR3, shared)
628824-001	Modem module, 56K, v.92 MDC 1.5 Guzzi F data/fax, for use in all countries **NOTE:** The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 649758-001. See Cable Kit on page 25 for more Cable Kit spare part number information.

Spare part number	Description
631954-001	Intel Centrino Advanced-N 6205 a/b/g/n WLAN module for use in Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bolivia, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Cayman Islands, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, the Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Finland, France, French Guiana, Gabon, Gambia, Germany, Ghana, Gibraltar, Greece, Grenada, Guinea, Guadeloupe, Guam. Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Liberia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Mali, Martinique, Mauritania, Mauritius, Mexico, Montenegro, Morocco, Mozambique, Namibia, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, Switzerland, Syria, Taiwan, Tanzania, Thailand, Togo, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, U.S. Virgin Islands, Venezuela, Vietnam, Yemen, and Zimbabwe
632155-001	Ericsson 5521 HSPA+ WWAN module for use in Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bolivia, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Cayman Islands, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, the Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Finland, France, French Guiana, Gabon, Gambia, Germany, Ghana, Gibraltar, Greece, Grenada, Guinea, Guadeloupe, Guam. Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Liberia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Mali, Martinique, Mauritania, Mauritius, Mexico, Montenegro, Morocco, Mozambique, Namibia, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, Switzerland, Syria, Taiwan, Tanzania, Thailand, Togo, Tunisia, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, U.S. Virgin Islands, Venezuela, Vietnam, Yemen, and Zimbabwe
634091-001	8-GB memory module (PC3-10600, 1333-MHz, DDR3, shared)

Spare part number	Description
634400-001	Qualcomm Gobi 3000 HSPA/CDMA WWAN module with GPS for use in Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bolivia, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Cayman Islands, the Central African Republic, Chad, Chile, Colombia, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, the Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Finland, France, French Guiana, Gabon, Gambia, Germany, Ghana, Gibraltar, Greece, Grenada, Guinea, Guadeloupe, Guam. Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Liberia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Mali, Martinique, Mauritania, Mauritius, Mexico, Montenegro, Morocco, Mozambique, Namibia, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, Switzerland, Syria, Taiwan, Tanzania, Thailand, Togo, Tunisia, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, U.S. Virgin Islands, Venezuela, Vietnam, Yemen, and Zimbabwe
649745-001	System board with Second Generation Intel Core i5 2410M Dual-Core processor [2.3-GHz (turbo up to 2.9 GHz), 3 MB L3 cache] for use in all countries and regions except Russia and the People's Republic of China
649746-001	System board with Second Generation Intel Core i5 2520M Dual-Core processor [2.5 GHz (turbo up to 3.2 GHz), 3 MB L3 cache] for use in all countries and regions except Russia and the People's Republic of China
649747-001	System board with Second Generation Intel Core i5 2540M Dual-Core processor [2.6 GHz (turbo up to 3.3 GHz), 3 MB L3 cache] for use in all countries and regions except Russia and the People's Republic of China
649748-001	System board with Second Generation Intel Core i7 2620M Dual-Core processor [2.7 GHz (turbo up to 3.4 GHz), 4 MB L3 cache] for use in all countries and regions except Russia and the People's Republic of China
649749-001	System board with Second Generation Intel Core i5 2410M Dual-Core processor [2.3-GHz (turbo up to 2.9 GHz), 3 MB L3 cache] for use only in Russia and the People's Republic of China
649750-001	System board with Second Generation Intel Core i5 2520M Dual-Core processor [2.5 GHz (turbo up to 3.2 GHz), 3 MB L3 cache] for use only in Russia and the People's Republic of China
649751-001	System board with Second Generation Intel Core i5 2540M Dual-Core processor [2.6-GHz (turbo up to 3.3 GHz), 3 MB L3 cache] for use only in Russia and the People's Republic of China
649752-001	System board with Second Generation Intel Core i7 2620M Dual-Core processor [2.7 GHz (turbo up to 3.4 GHz), 4 MB L3 cache] for use only in Russia and the People's Republic of China
649753-001	**30.7 cm** (12.1 in) WXGA, LED, AntiGlare touch screen display assembly (includes 2 WLAN antenna transceivers and 2 WWAN antenna transceivers and cables)
649754-001	**30.7 cm** (12.1 in) WXGA, LED, AntiGlare touch screen display assembly for use outdoors (includes 2 WLAN antenna transceivers and 2 WWAN antenna transceivers and cables)
649756-001	Keyboard with TouchPad and pointing stick for use in the United States (includes buttons and cables)
649756-031	Keyboard with TouchPad and pointing stick for use in the United Kingdom (includes buttons and cables)
649756-041	Keyboard with TouchPad and pointing stick for use in Germany (includes buttons and cables)

Spare part number	Description
649756-051	Keyboard with TouchPad and pointing stick for use in France (includes buttons and cables)
649756-061	Keyboard with TouchPad and pointing stick for use in Italy (includes buttons and cables)
649756-071	Keyboard with TouchPad and pointing stick for use in Spain (includes buttons and cables)
649756-081	Keyboard with TouchPad and pointing stick for use in Denmark (includes buttons and cables)
649756-091	Keyboard with TouchPad and pointing stick for use in Norway (includes buttons and cables)
649756-121	Keyboard with TouchPad and pointing stick for use in French Canada (includes buttons and cables)
649756-131	Keyboard with TouchPad and pointing stick for use in Portugal (includes buttons and cables)
649756-141	Keyboard with TouchPad and pointing stick for use in Turkey (includes buttons and cables)
649756-161	Keyboard with TouchPad and pointing stick for use in Latin America (includes buttons and cables)
649756-171	Keyboard with TouchPad and pointing stick for use in Saudi Arabia (includes buttons and cables)
649756-201	Keyboard with TouchPad and pointing stick for use in Brazil (includes buttons and cables)
649756-211	Keyboard with TouchPad and pointing stick for use in Hungary (includes buttons and cables)
649756-251	Keyboard with TouchPad and pointing stick for use in Russia (includes buttons and cables)
649756-261	Keyboard with TouchPad and pointing stick for use in Bulgaria (includes buttons and cables)
649756-281	Keyboard with TouchPad and pointing stick for use in Thailand (includes buttons and cables)
649756-291	Keyboard with TouchPad and pointing stick for use in Japan (includes buttons and cables)
649756-A41	Keyboard with TouchPad and pointing stick for use in Belgium (includes buttons and cables)
649756-A81	Keyboard with TouchPad and pointing stick for use in the Czech Republic and Slovakia (includes buttons and cables)
649756-AB1	Keyboard with TouchPad and pointing stick for use in Taiwan (includes buttons and cables)
649756-AD1	Keyboard with TouchPad and pointing stick for use in Korea (includes buttons and cables)
649756-B31	Keyboard with TouchPad and pointing stick for use internationally (includes buttons and cables)
649756-B71	Keyboard with TouchPad and pointing stick for use in Sweden and Finland (includes buttons and cables)
649756-BB1	Keyboard with TouchPad and pointing stick for use in Israel (includes buttons and cables)
649756-BG1	Keyboard with TouchPad and pointing stick for use in Switzerland (includes buttons and cables)
649756-DD1	Keyboard with TouchPad and pointing stick for use in Iceland (includes buttons and cables)
649756-DH1	Keyboard with TouchPad and pointing stick for use in Denmark, Finland, Norway, and Sweden (includes buttons and cables)
649756-DJ1	Keyboard with TouchPad and pointing stick for use in Greece (includes buttons and cables)
649756-DW1	Keyboard with TouchPad and pointing stick for use in Northwest Africa (includes buttons and cables)
649757-001	Base enclosure (includes latch)
649758-001	Cable Kit
649759-001	Fan/heat sink assembly (includes replacement thermal material)

Spare part number	Description
649760-001	System board shield
649762-001	Audio connector board
649764-001	Plastics Kit
649765-001	Rubber Kit (includes feet)
649766-001	Screw Kit
649767-001	Speaker assembly
649768-001	Top cover assembly (includes TouchPad board, QuickWeb button, and capacitive board)
649769-001	RTC battery
653017-001	128 GB solid-state drive (includes bracket)
653018-001	160 GB solid-state drive (includes bracket)
656619-001	Hard drive, 250 GB, 7200 rpm, SATA 7 mm (2.5 in)
656620-001	Hard drive, 320 GB, 7200 rpm, SATA 7 mm (2.5 in)
656621-001	Hard drive, 320 GB, 7200 rpm, SATA 7 mm (2.5 in) self-encrypting drive (SED)
657835-001	External Antenna

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

You will need the following tools to complete the removal and replacement procedures:

- Flat-bladed screwdriver
- Phillips P0 and P1 screwdrivers
- Torx T8 screwdriver

Service considerations

The following sections include some of the considerations that you must keep in mind during disassembly and assembly procedures.

NOTE: As you remove each subassembly from the computer, place the subassembly (and all accompanying screws) away from the work area to prevent damage.

Plastic parts

CAUTION: Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic parts. Apply pressure only at the points designated in the maintenance instructions.

Cables and connectors

⚠ **CAUTION:** When servicing the computer, be sure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the computer.

Cables must be handled with extreme care to avoid damage. Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing cables. Be sure that cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced. Handle flex cables with extreme care; these cables tear easily.

Drive handling

⚠ **CAUTION:** Drives are fragile components that must be handled with care. To prevent damage to the computer, damage to a drive, or loss of information, observe these precautions:

Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.

Before removing a diskette drive or optical drive, be sure that a diskette or disc is not in the drive and be sure that the optical drive tray is closed.

Handle drives on surfaces covered with at least one inch of shock-proof foam.

Avoid dropping drives from any height onto any surface.

Avoid exposing a hard drive to products that have magnetic fields, such as monitors or speakers.

Avoid exposing a drive to temperature extremes or liquids.

If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package “FRAGILE.”

Grounding guidelines

Electrostatic discharge damage

Electronic components are sensitive to electrostatic discharge (ESD). Circuitry design and structure determine the degree of sensitivity. Networks built into many integrated circuits provide some protection, but in many cases, ESD contains enough power to alter device parameters or melt silicon junctions.

A discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Even if the spark is neither felt nor heard, damage may have occurred.

An electronic device exposed to ESD may not be affected at all and can work perfectly throughout a normal cycle. Or the device may function normally for a while, and then degrade in the internal layers, reducing its life expectancy.

⚠ **CAUTION:** To prevent damage to the computer when you are removing or installing internal components, observe these precautions:

Keep components in their electrostatic-safe containers until you are ready to install them.

Use nonmagnetic tools.

Before touching an electronic component, discharge static electricity by using the guidelines described in this section.

Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.

If you remove a component, place it in an electrostatic-safe container.

The following table shows how humidity affects the electrostatic voltage levels generated by different activities.

⚠ **CAUTION:** A product can be degraded by as little as 700 V.

Typical electrostatic voltage levels

	Relative humidity		
Event	**10%**	**40%**	**55%**
Walking across carpet	35,000 V	15,000 V	7,500 V
Walking across vinyl floor	12,000 V	5,000 V	3,000 V
Motions of bench worker	6,000 V	800 V	400 V
Removing DIPS from plastic tube	2,000 V	700 V	400 V
Removing DIPS from vinyl tray	11,500 V	4,000 V	2,000 V
Removing DIPS from Styrofoam	14,500 V	5,000 V	3,500 V
Removing bubble pack from PCB	26,500 V	20,000 V	7,000 V
Packing PCBs in foam-lined box	21,000 V	11,000 V	5,000 V

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items from their containers.
- Always be properly grounded when touching a component or assembly.
- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.
- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

Equipment guidelines

Grounding equipment must include either a wrist strap or a foot strap at a grounded workstation.

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm ±10% resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tape
- Antistatic smocks, aprons, and sleeve protectors
- Conductive bins and other assembly or soldering aids
- Nonconductive foam
- Conductive tabletop workstations with ground cords of one megohm resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

The following table lists the shielding protection provided by antistatic bags and floor mats.

Material	Use	Voltage protection level
Antistatic plastic	Bags	1,500 V
Carbon-loaded plastic	Floor mats	7,500 V
Metallized laminate	Floor mats	5,000 V

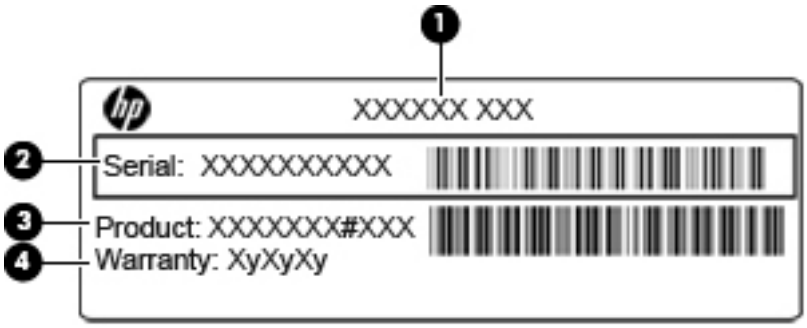
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 43 screws in 12 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Service tag

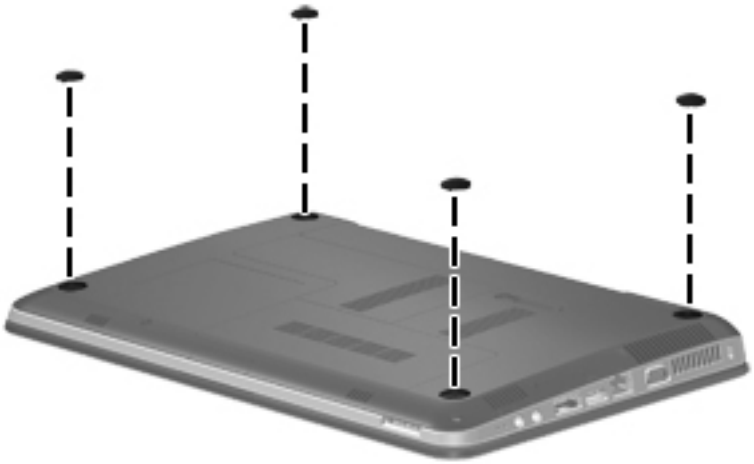
When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag.



	Component	Description
(1)	Product name	The product name affixed to the front of your computer.
(2)	Serial number	An alphanumeric identifier that is unique to each product.
(3)	Product part number	The identifier that provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
(4)	Warranty	The duration of the warranty period for this computer.

Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 649765-001. There are four rubber feet that attach to the base enclosure in the locations illustrated below.



Pen

Description	Spare part number
Digitizer pen with eraser (includes tether)	606899-001

Remove the pen:

1. Position the computer right-side up, with the left side toward you.
2. Pull the loop on the tether until it is large enough to pass the pen through it, and then pull the pen through the loop **(1)**.
3. Remove the pen and tether from the computer **(2)**.

Reverse this procedure to install the pen.

Battery

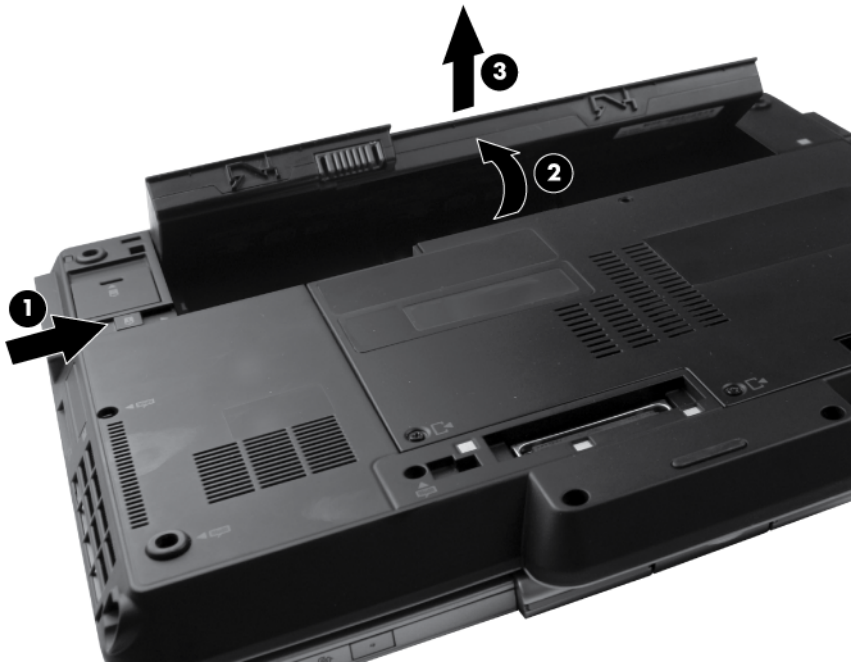
Description	Spare part number
6-cell, 44 Whr, 2.0 Ah, Li-ion battery	454668-001
6-cell, 39 Whr, 2.0 Ah, Li-ion battery	593592-001

Before disassembling the computer, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

Remove the battery:

1. Turn the computer upside-down on a flat surface, with the battery bay toward you.
2. Slide the battery release latch **(1)** to release the battery.
3. Pivot the edge of the battery upward **(2)** and remove it from the computer **(3)**.



To insert the battery, insert the front edge of the battery into the battery bay and pivot the rear edge of the battery downward until it is seated. The battery release latch automatically locks the battery into place.

Service access cover

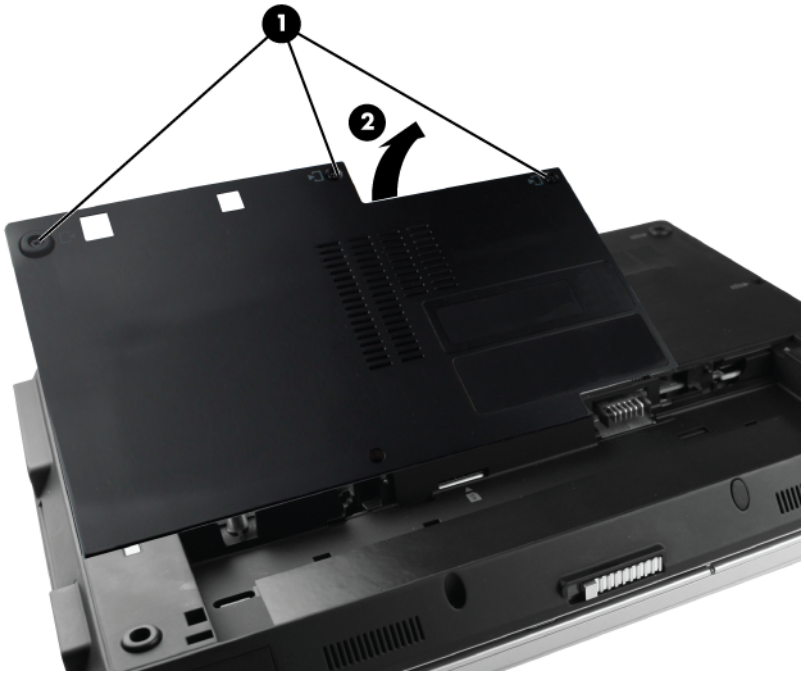
NOTE: The service access cover is included in the Plastics Kit, spare part number 649764-001.

Before removing the service access cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 43)

Remove the service access cover:

1. Position the computer upside-down, with the front toward you.
2. Loosen the three Phillips M2.0x3.0 captive screws **(1)** that secure the service access cover to the computer.
3. Lift the rear edge of the service access cover **(2)** until it rests at an angle, and then remove the cover.



Reverse this procedure to install the service access cover.

Primary memory module

Description	Spare part number
2 GB (PC3-10600, 1333 MHz, DDR3)	621565-001
4 GB (PC3-10600, 1333 MHz, DDR3)	621569-001
8 GB (PC3-10600, 1333 MHz, DDR3)	634091-001

Update BIOS before adding memory modules

Before adding new memory, make sure you update the computer to the latest BIOS.

⚠ **CAUTION:** Failure to update the computer to the latest BIOS prior to installing new memory may result in various system problems.

To update BIOS:

1. Navigate to www.hp.com.
2. Click **Support & Drivers >** click **Drivers & Software**.
3. In the **Enter a product name/number** box, type the computer model information, and then click **Search**.
4. Click the link for the computer model.
5. Select the operating system, and then click **Next**.
6. Under **Step 2: Select a Download**, click the **BIOS** link.
7. Click the link for the most recent BIOS.
8. Click the **Download** button, and then follow the on-screen instructions.

Before removing the memory module, follow these steps:

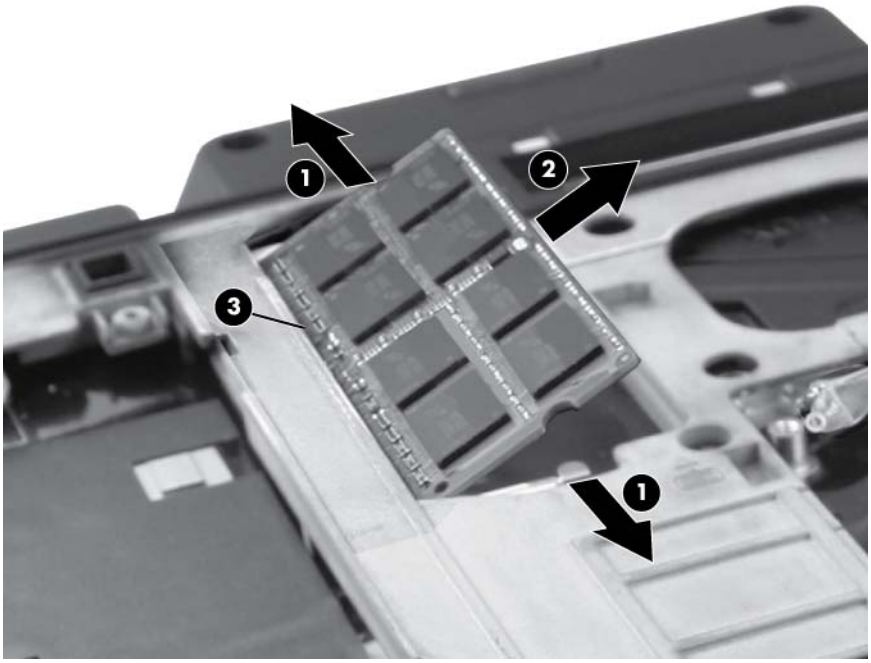
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)

Remove the primary memory module:

1. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

2. Remove the memory module **(2)** by pulling the module away from the slot at an angle.

NOTE: Memory modules are designed with a notch **(3)** to prevent incorrect insertion into the memory module slot.



Reverse this procedure to install a primary memory module.

SIM

NOTE: This section applies only to computer models with WWAN capability.

NOTE: If there is a SIM inserted in the SIM slot, it must be removed before disassembling the computer. Be sure that the SIM is reinserted in the SIM slot after reassembling the computer.

Before removing the SIM, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the memory module (see Primary memory module on page 45)

Remove the SIM:

1. Press in on the SIM **(1)**. (The module is partially ejected from the SIM slot.)
2. Remove the SIM from the SIM slot.

Reverse this procedure to install the SIM.

Hard drive

NOTE: The hard drive spare part kits include the bracket and the screws.

Description	Spare part number
320 GB, 7200 rpm, **7 mm** (2.5 in) SED hard drive	656621-001
320 GB, 7200 rpm, **7 mm** (2.5 in) hard drive	656620-001
250 GB, 7200 rpm, **7 mm** (2.5 in) hard drive	656619-001
160 GB solid-state drive (SSD)	653018-001
128 GB SSD	653017-001

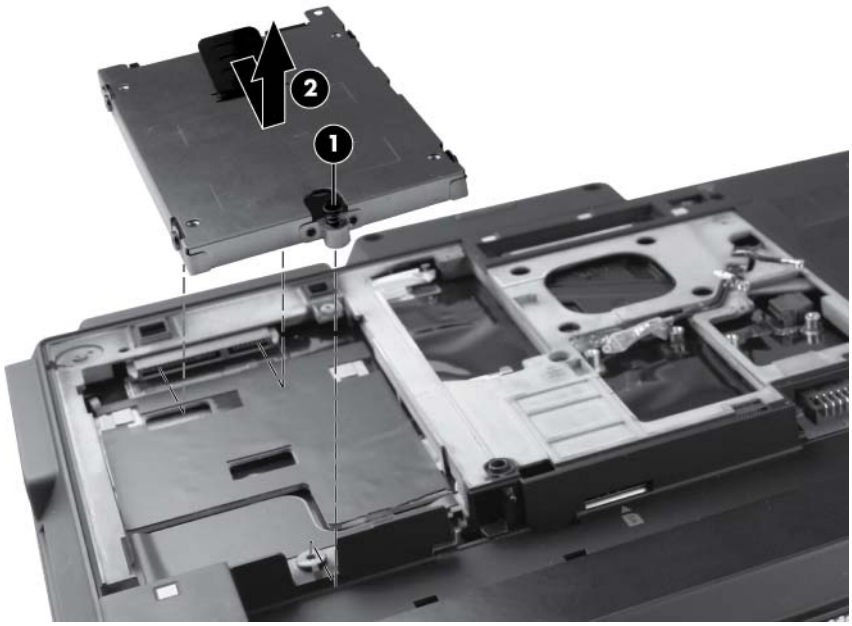
Before removing the hard drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)

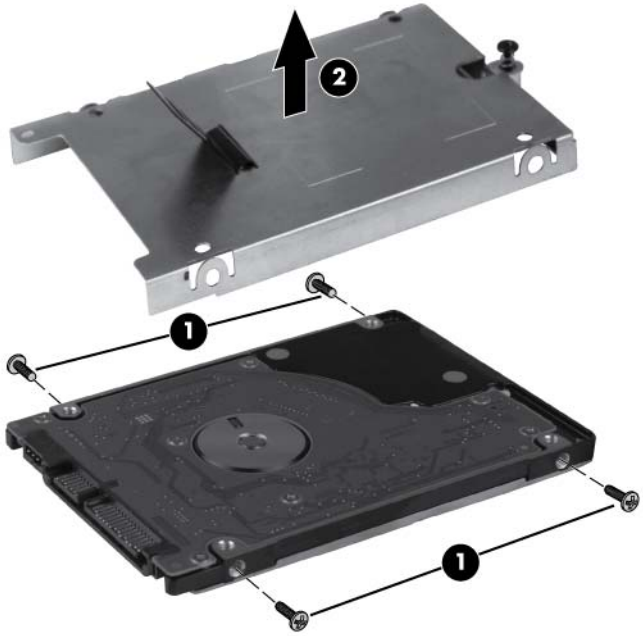
Remove the hard drive:

1. Loosen the Phillips M2.5×8.0 captive screw **(1)** that secures the hard drive bracket to the computer.
2. Grasp the tab on the hard drive and slide it forward to disconnect the hard drive.

3. Lift the hard drive **(2)** to remove it from the computer.



4. If it is necessary to replace the hard drive bracket, remove the four Phillips M2.5x3.0 screws **(1)** that secure the bracket to the hard drive.
5. Lift the bracket **(2)** straight up to remove it from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

WLAN module

CAUTION: The WLAN module and the WWAN module are not interchangeable.

Description	Spare part number
Broadcom 43224 802.11 a/b/g/n 2x2 WiFi Adapter: For use in Antigua and Barbuda, Argentina, Aruba, the Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, the British Virgin Islands, Canada, Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, French Guiana, Grenada, Guadeloupe, Guam, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, the Nether Antilles, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, the United States, Uruguay, U.S. Virgin Islands, and Venezuela	582564-001
Broadcom 43224 802.11 a/b/g/n 2x2 WiFi Adapter: For use in Albania, Algeria, Angola, Australia, Austria, Bahrain, Bangladesh, Belarus, Belgium, Benin, Botswana, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, the People's Republic of China, the Congo, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Egypt, Equatorial Guinea, Estonia, Finland, France, Gabon, Gambia, Germany, Ghana, Gibraltar, Greece, Guinea, Guinea-Bissau, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Japan, Jordan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Liberia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Mali, Mauritania, Mauritius, Montenegro, Morocco, Mozambique, Namibia, Nepal, the Netherlands, New Zealand, Niger, Nigeria, Norway, Oman, Pakistan, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Switzerland, Syria, Taiwan, Tanzania, Thailand, Togo, Tunisia, Turkey, the United Arab Emirates, the United Kingdom, Vietnam, Yemen, and Zimbabwe	582564-002

Description	Spare part number
Broadcom 4322 AGN 802.11a/b/g/draft-n WLAN module: For use in Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bolivia, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Cayman Islands, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, the Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Finland, France, French Guiana, Gabon, Gambia, Germany, Ghana, Gibraltar, Greece, Grenada, Guinea, Guadeloupe, Guam. Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Liberia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Mali, Martinique, Mauritania, Mauritius, Mexico, Montenegro, Morocco, Mozambique, Namibia, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, Switzerland, Syria, Taiwan, Tanzania, Thailand, Togo, Tunisia, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, U.S. Virgin Islands, Venezuela, Vietnam, Yemen, and Zimbabwe	593836-001
Intel Centrino Advanced-N6205 (2x2) WiFi Adapter: For use in Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bolivia, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Cayman Islands, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, the Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Finland, France, French Guiana, Gabon, Gambia, Germany, Ghana, Gibraltar, Greece, Grenada, Guinea, Guadeloupe, Guam. Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Liberia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Mali, Martinique, Mauritania, Mauritius, Mexico, Montenegro, Morocco, Mozambique, Namibia, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, Switzerland, Syria, Taiwan, Tanzania, Thailand, Togo, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, U.S. Virgin Islands, Venezuela, Vietnam, Yemen, and Zimbabwe	631954-001

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)

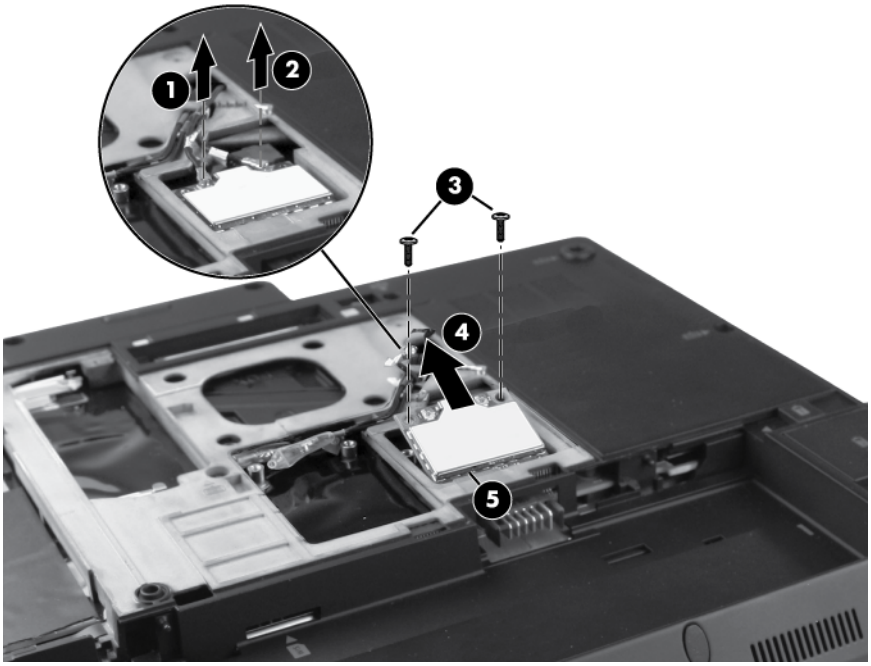
Remove the WLAN module:

1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module and disengage them from the channels **(2)** holding them in place.

NOTE: The black WLAN antenna cable is connected to the WLAN module "Main" terminal. The white WLAN antenna cable is connected to the WLAN module "Aux" terminal.

2. Remove the two Phillips M2.5×3.0 screws **(3)** that secure the WLAN module to the computer.
3. Remove the WLAN module by pulling the module away from the slot at an angle **(4)**.

NOTE: WLAN modules are designed with a notch **(5)** to prevent incorrect insertion.



Reverse this procedure to install the WLAN module.

WWAN module

CAUTION: The WWAN module and the WLAN module are not interchangeable.

Description	Spare part number
Ericsson 5521 HSPA+ WWAN module	632155-001
Qualcomm Gobi 3000 HSPA/CDMA WWAN module with GPS (not available in China)	634400-001

Before removing the WWAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)

Remove the WWAN module:

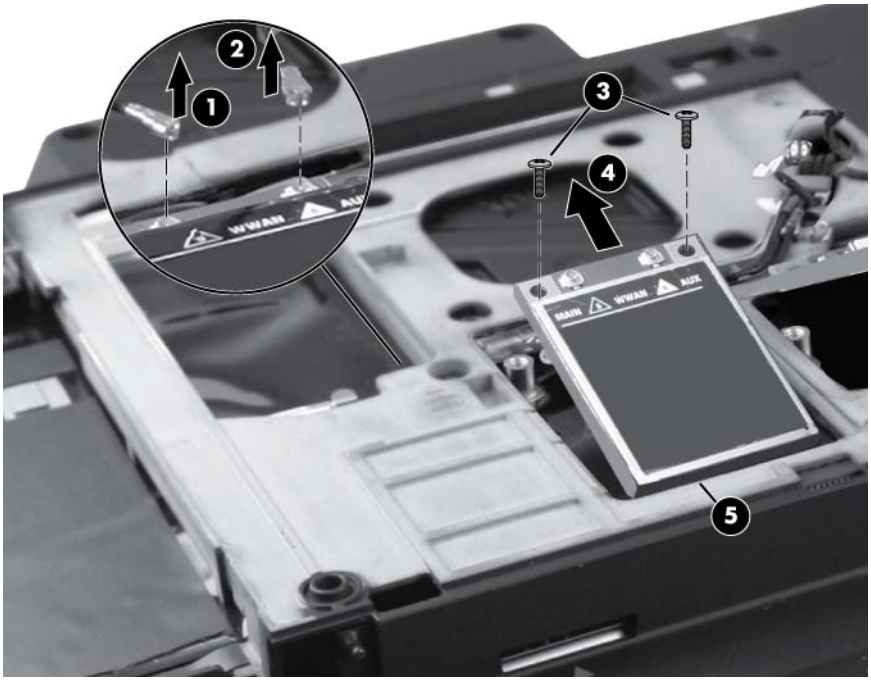
1. Disconnect the WWAN antenna cables **(1)** and **(2)** from the terminals on the WWAN module.

NOTE: The red WWAN antenna cable is connected to the WWAN module “Main” terminal. The blue WWAN antenna cable is connected to the WWAN module “Aux” terminal.

2. Remove the two Phillips M2.5×3.0 screws **(3)** that secure the WWAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

3. Remove the WWAN module **(4)** by pulling the module away from the slot at an angle.

NOTE: WWAN modules are designed with a notch **(5)** to prevent incorrect insertion.



Reverse this procedure to install the WWAN module.

Keyboard

For use in:	Spare part number	For use in:	Spare part number
Keyboard with TouchPad and pointing stick (includes buttons and cables):			
Belgium	649756-A41	Northwest Africa	649756-DW1
Brazil	649756-201	Portugal	649756-131
Bulgaria	649756-261	Russia	649756-251
Denmark	649756-081	Saudi Arabia	649756-171
France	649756-051	Slovakia and The Czech Republic	649756-A81
French Canada	649756-121	South Korea	649756-AD1
Germany	649756-041	Spain	649756-071
Greece	649756-DJ1	Sweden and Finland	649756-DH1
Hungary	649756-211	Sweden, Denmark, Norway, Finland	649756-B71
Iceland	649756-DD1	Switzerland	649756-BG1
International	649756-B31	Taiwan	649756-AB1
Israel	649756-BB1	Thailand	649756-281
Italy	649756-061	Turkey	649756-141
Japan	649756-291	The United Kingdom	649756-031
Latin America	649756-161	The United States	649756-001
Norway	649756-091		

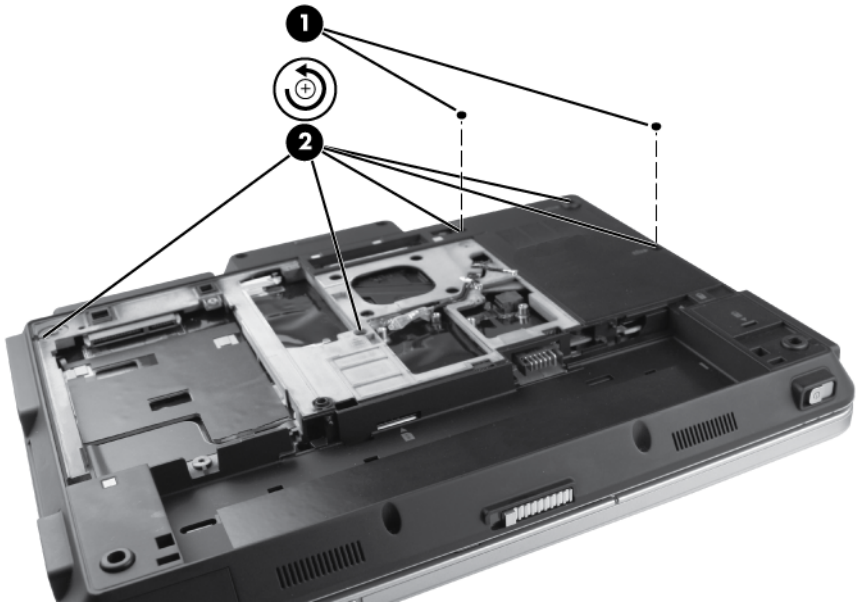
Before removing the keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove ths service access cover (see Service access cover on page 44)

Remove the keyboard:

1. Turn the computer upside-down, with the front toward you.

2. Remove the two screw caps **(1)** and loosen the five captive screws **(2)** that secure the keyboard to the computer.

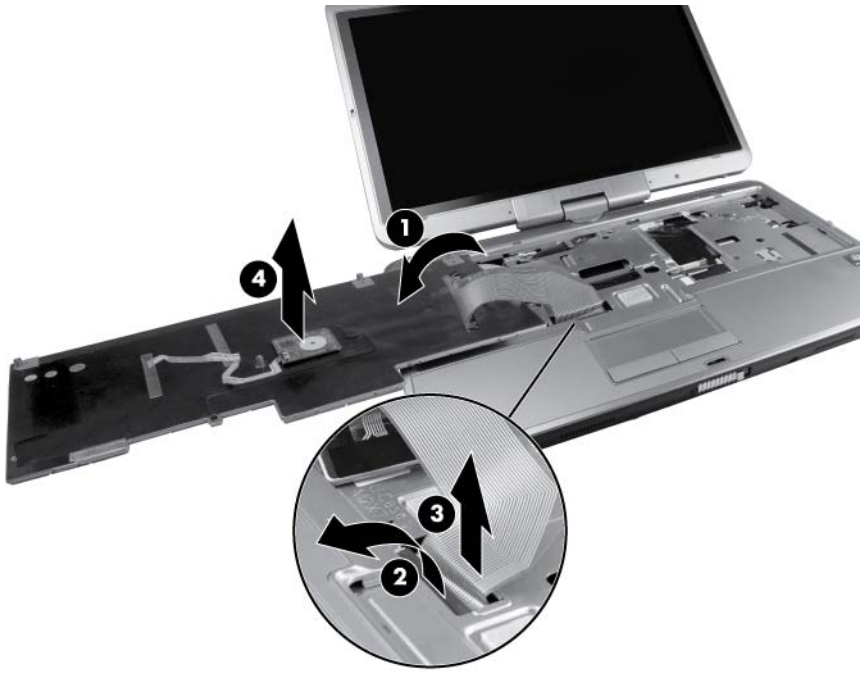


3. Turn the computer right-side up, with the front toward you.
4. Open the display as far as possible.
5. Insert a flat tool under the back edge **(1)** of the keyboard near the display hinge. Gently lift the rear edge of the keyboard **(2)** and disconnect the keyboard.

6. Holding the keyboard at an angle, lift the keyboard **(1)** far enough to gain access to the cables underneath and release the zero insertion force (ZIF) connector **(2)** to which the pointing stick cable is attached to the system board and remove the pointing stick ZIF cable **(3)** from the connector.

7. Flip the keyboard over to the left and lay it flat **(1)**, then release the ZIF connector that secures the keyboard cable **(2)** to the system board and remove the keyboard cable **(3)** from the ZIF connector.

8. Release the ZIF connector to which the pointing stick cable is attached, and then disconnect the cable **(4)** from the keyboard.



9. Remove the keyboard.

Reverse this procedure to install the keyboard.

Secondary memory module

Description	Spare part number
1 GB (PC3-10600, 1333 MHz, DDR3)	639738-001
2 GB (PC3-10600, 1333 MHz, DDR3)	621565-001
4 GB (PC3-10600, 1333 MHz, DDR3)	621569-001
8 GB (PC3-10600, 1333 MHz, DDR3)	634091-001

Update BIOS before adding memory modules

Before adding new memory, make sure you update the computer to the latest BIOS.

⚠ **CAUTION:** Failure to update the computer to the latest BIOS prior to installing new memory may result in various system problems.

To update BIOS:

1. Navigate to www.hp.com.
2. Click **Support & Drivers >** click **Drivers & Software**.

3. In the **Enter a product name/number** box, type the computer model information, and then click **Search**.
4. Click the link for the computer model.
5. Select the operating system, and then click **Next**.
6. Under **Step 2: Select a Download**, click the **BIOS** link.
7. Click the link for the most recent BIOS.
8. Click the **Download** button, and then follow the on-screen instructions.

Before removing the memory module, follow these steps:

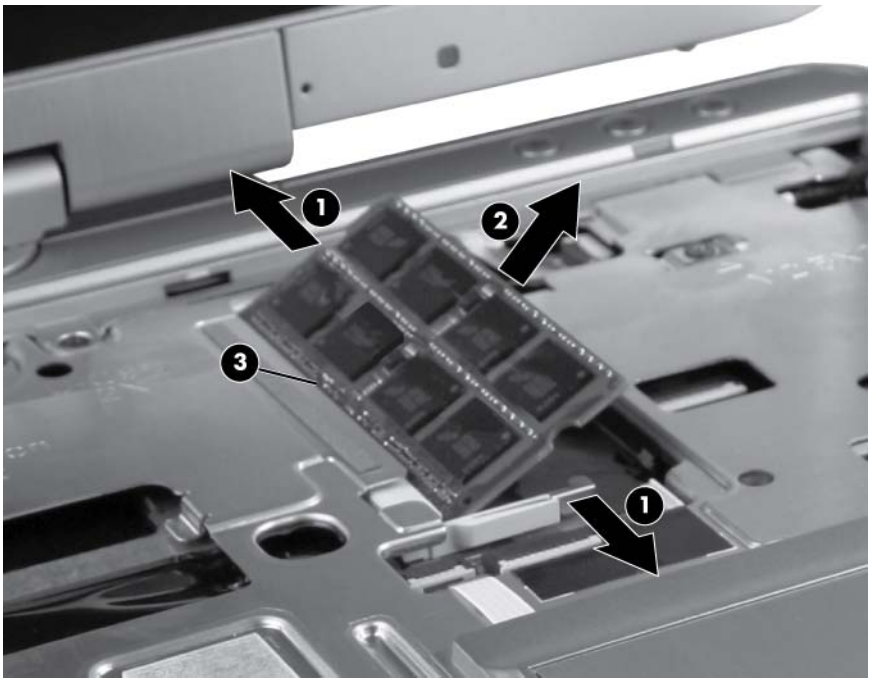
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Service access cover (see Service access cover on page 44)
   c. Remove the keyboard (see Keyboard on page 55)

Remove the secondary memory module:

1. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

2. Remove the memory module **(2)** by pulling the module away from the slot at an angle.

NOTE: Memory modules are designed with a notch **(3)** to prevent incorrect insertion into the memory module slot.



Reverse this procedure to install a secondary memory module.

Top cover

The top cover kit includes the TouchPad board and capacitive board.

Description	Spare part number
Top cover	649768-001

Before removing the top cover, follow these steps:

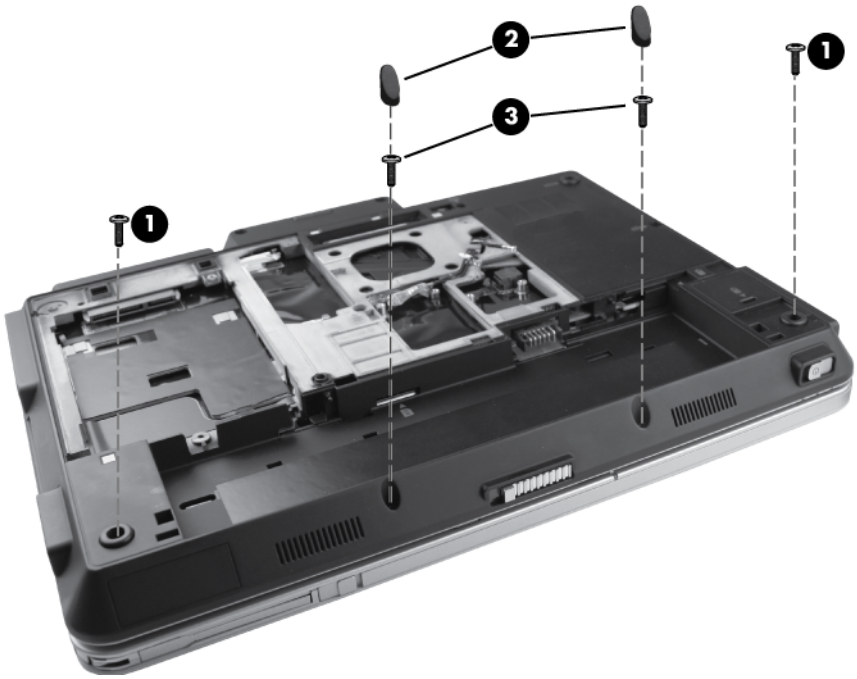
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)

c. Remove the keyboard (see Keyboard on page 55)

d. Remove the secondary memory module (see Secondary memory module on page 58)

Remove the top cover:

1. Turn the computer upside-down, with the front toward you.
2. Remove the two Torx 8M2.0×7.0 screws **(1)** located in the bottom feet. You do not need to remove the feet.
3. Remove the two screw caps **(2)** and the two Torx 8M2.0x5.0 screws **(3)** located below the battery bay.

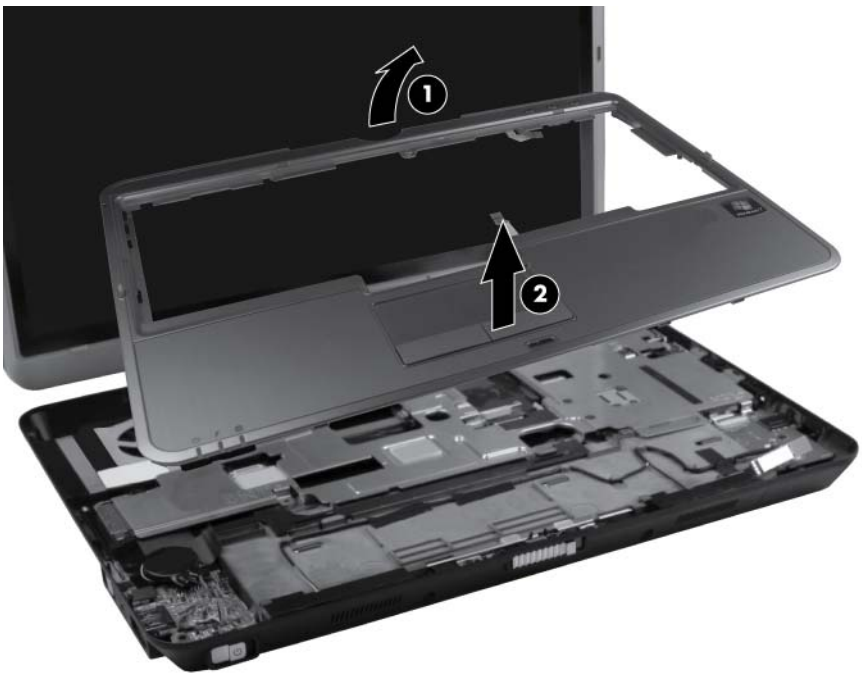


4. Turn the computer right-side up, with the front toward you.
5. Open the display as far as possible.
6. Release the ZIF connector **(1)** that secures the audio cable to the system board and remove the audio cable **(2)** from the ZIF connector.
7. Release the ZIF connector **(3)** that secures the TouchPad button cable to the system board and remove the touchpad button cable **(4)** from the ZIF connector.

8. Remove the two Phillips M2.5x7.0 screws **(5)**.

9. Lift the rear edge **(1)** of the top cover.

10. Disengage the top cover from the computer, and then lift the top cover **(2)** up and off the computer.



NOTE: A small plastic brace for the VGA port rests below the top cover. Simply lift the brace.

11. Remove the Phillips M2.0x2.0 screw **(1)** from the volume control board and slide the volume control **(2)** out from the tab.

Reverse this procedure to install the top cover.

TouchPad board

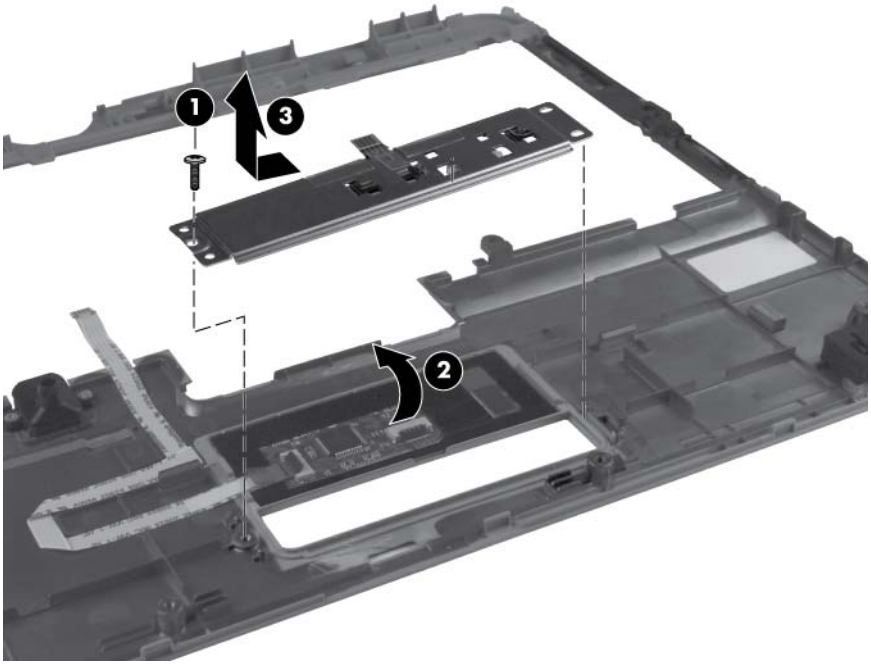
NOTE: The TouchPad board is available with the top cover kit, spare part number 649768-001.

Before removing the TouchPad board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the keyboard (see Keyboard on page 55)
   d. Remove the top cover (see Top cover on page 60)

Remove the TouchPad board:

1. Position the computer right-side up, with the front toward you.
2. Remove the Phillips M2.0x3.5 screw **(1)** that secures the TouchPad to the top cover.
3. Disconnect the TouchPad cable **(2)** from the TouchPad board ZIF connector and then slide the board **(3)** out from the tab.



Reverse this procedure to install the TouchPad board.

RTC battery

Description	Spare part number
RTC battery	649769-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the keyboard (see Keyboard on page 55)
   d. Remove the top cover (see Top cover on page 60)

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.
2. Gently pull the battery away from the double-sided tape that secures the battery **(2)** to the system board and remove it from the computer.

Reverse this procedure to install the RTC battery.

Display assembly

The display assemblies include two WLAN antenna transceivers and cables and two WWAN antenna transceivers and cables.

Description	Spare part number
30.7 cm (12.1 in) WXGA, LED, AntiGlare touch screen display assembly	649753-001
30.7 cm (12.1 in) WXGA, LED, AntiGlare touch screen display assembly for use outdoors	649754-001

Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the WLAN module (see WLAN module on page 50)
   d. Remove the WWAN module (see WWAN module on page 53)
   e. Remove the keyboard (see Keyboard on page 55)
   f. Remove the top cover (see Top cover on page 60)

Remove the display assembly:

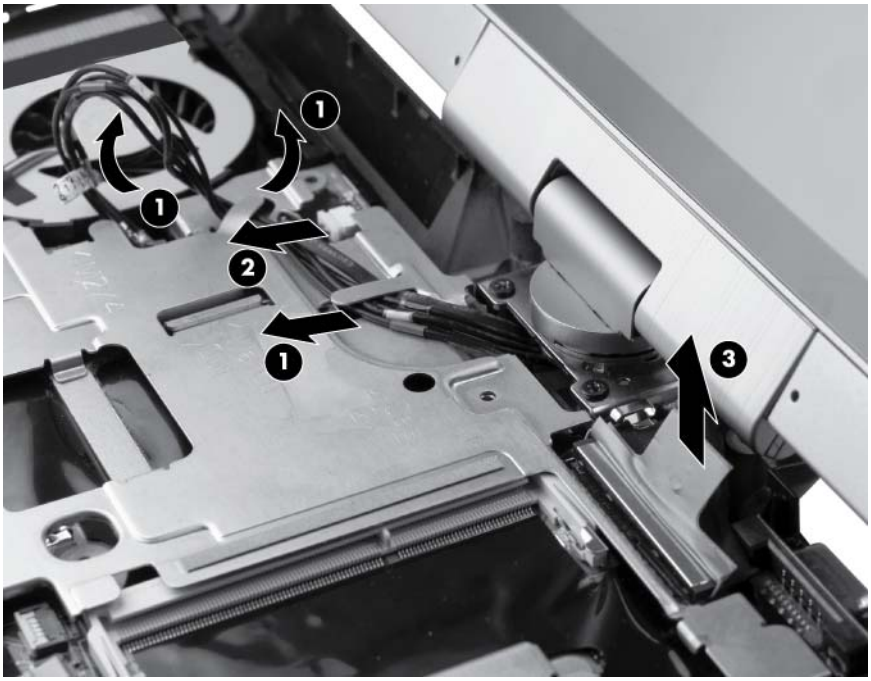
1. Position the computer upside down, with the rear toward you.

2. Remove the two Torx 9 M2.0×5.0 screws that secure the hinge cover to the computer.

3. Position the computer right-side up, with the rear toward you.
4. Slide the hinge cover away from the computer. The hinge cover is available in the Plastics Kit, spare part number 649764-001.

5. Position the computer right-side up, with the front toward you and open the display so it stands straight up.
6. Feed the WWAN and WLAN antennas **(1)** through the bottom of the base enclosure and remove the antennas.
7. Disconnect the webcam cable **(2)** from the system board.

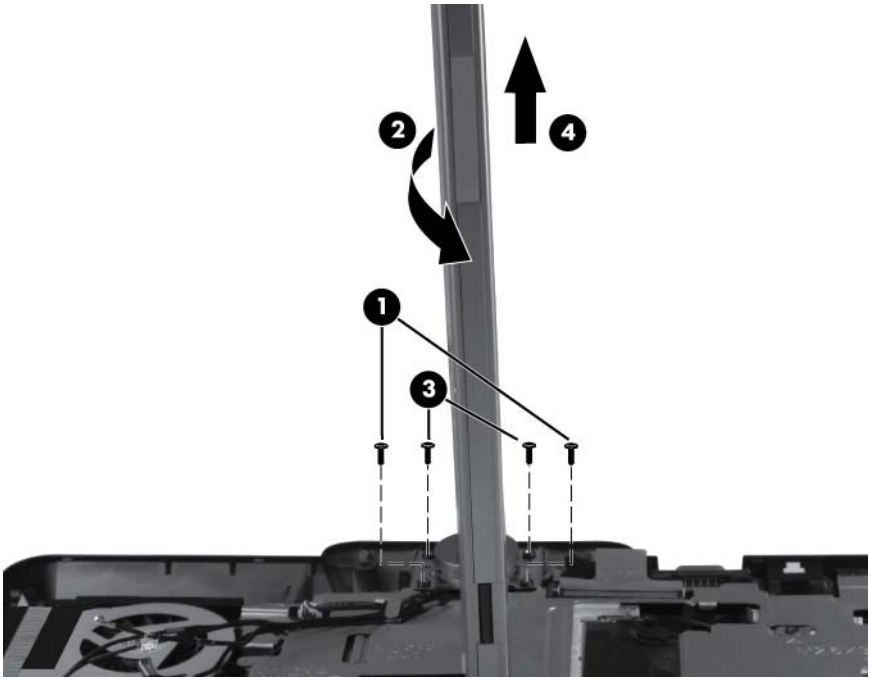
8. Disconnect the display cable **(3)** from the system board.



CAUTION: Support the display assembly when removing the display screws in the following step. Failure to support the display assembly can result in damage to the assembly and other components.

9. Remove the two Phillips M2.5x6.0 screws **(1)** that secure the display assembly to the base enclosure.
10. Gently rotate the display **(2)** and swivel it at a 90-degree angle to gain access to the remaining screws in the display bracket.
11. Remove the two Phillips M2.5 x 6.0 screws **(3)** that secure the display bracket to the base enclosure.

12. Lift the display straight up to remove it from the base enclosure **(4)**.



Reverse this procedure to reassemble and install the display assembly.

System board shield

Description	Spare part number
System board shield	649760-001

Before removing the system board shield, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the WLAN module (see WLAN module on page 50)
   d. Remove the WWAN module (see WWAN module on page 53)
   e. Remove the keyboard (see Keyboard on page 55)

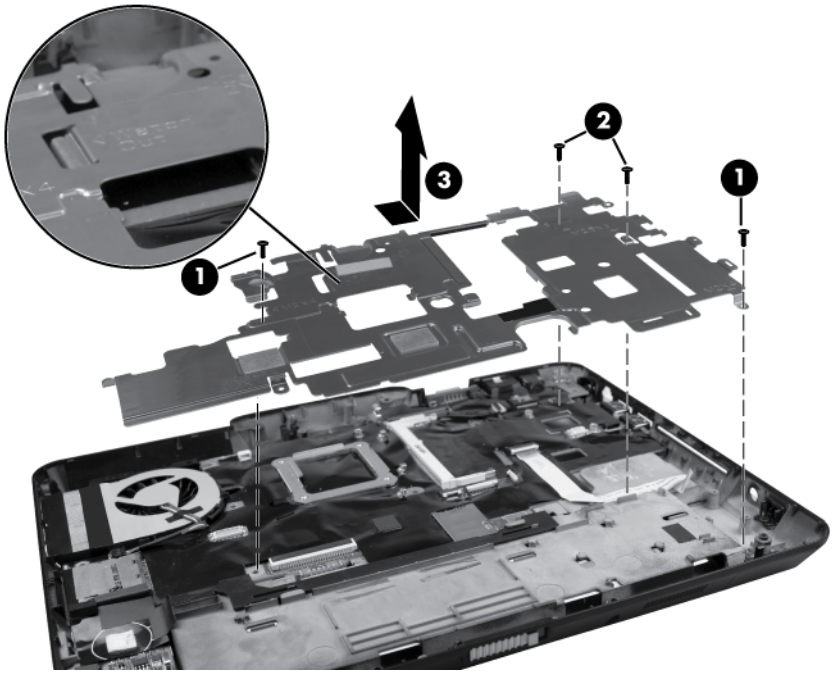
f. Remove the top cover (see Top cover on page 60)

g. Remove the display assembly (see Display assembly on page 66)

Remove the system board shield:

1. Position the computer right-side up, with the front toward you.
2. Remove the four Phillips M2.5×3.0 screws **(1)** and **(2)** that secure the shield to the base enclosure.
3. Slide the shield from the computer **(3)**.

WARNING! Use caution when handling the system shield as the object may be hot.



Reverse this procedure to install the system board shield.

NOTE: When installing a replacement system board shield, take care that the tab labeled "Watch Out" is inserted correctly under the heat sink so that the keyboard lies flat when replaced.

Modem module

NOTE: The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 649758-001. See Cable Kit on page 25 for more Cable Kit spare part number information.

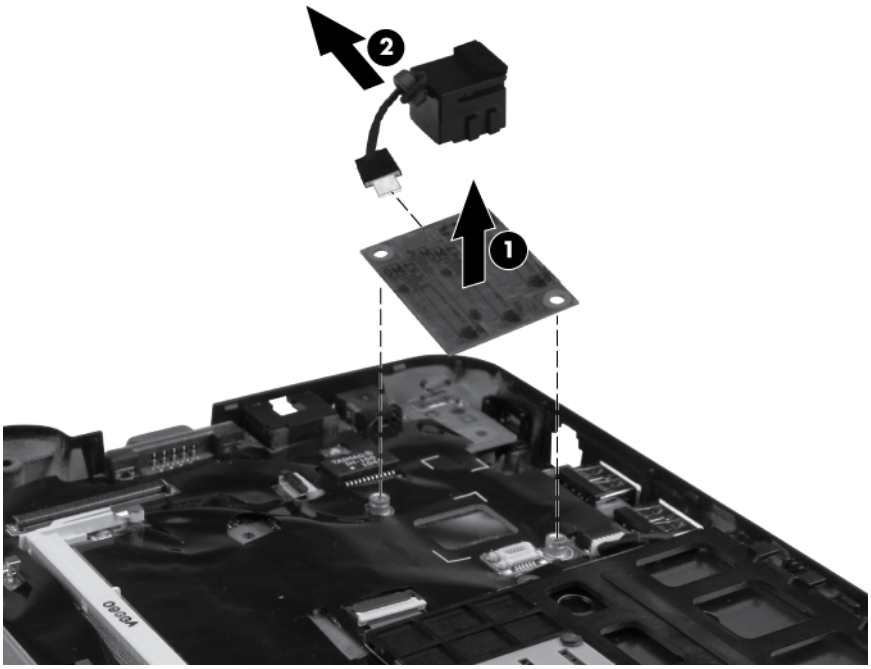
Description	Spare part number
Modem module	628824-001

Before removing the modem module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the WLAN module (see WLAN module on page 50)
   d. Remove the WWAN module (see WWAN module on page 53)
   e. Remove the keyboard (see Keyboard on page 55)
   f. Remove the top cover (see Top cover on page 60)
   g. Remove the display assembly (see Display assembly on page 66)
   h. Remove the system board shield (see System board shield on page 69)

Remove the modem module:

1. Turn the computer right-side up, with the front toward you.
2. Disconnect the modem module **(1)** from the system board by lifting it straight up.
3. Disconnect the modem module cable **(2)** from the modem module, and then remove the module from the computer.



Reverse this procedure to install the modem module.

Bluetooth module

NOTE: The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 649758-001. See Cable Kit on page 25 for more Cable Kit spare part number information.

Description	Spare part number
Bluetooth module	537921-001

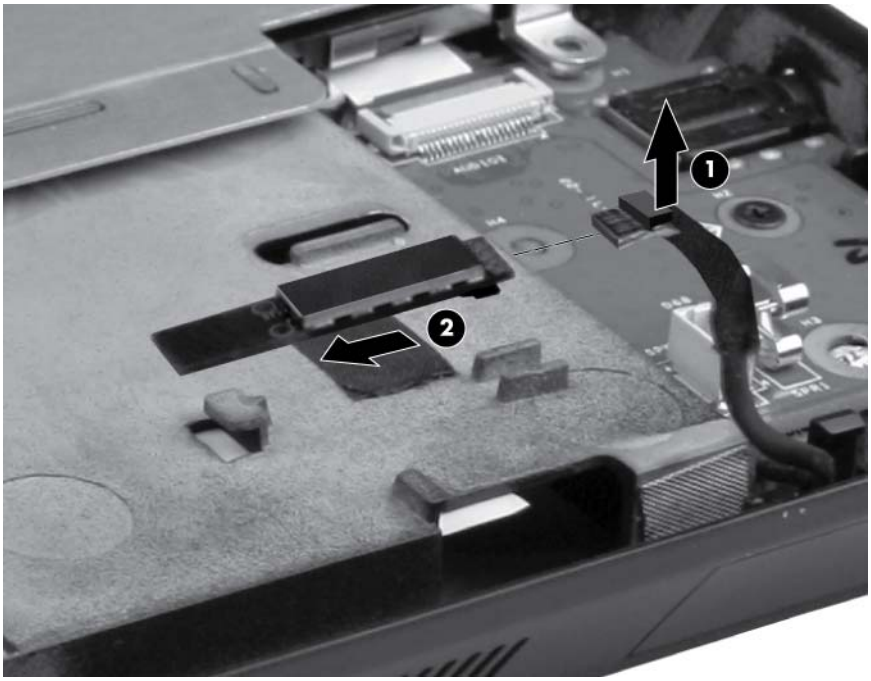
Before removing the Bluetooth module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the WLAN module (see WLAN module on page 50)
   d. Remove the WWAN module (see WWAN module on page 53)
   e. Remove the keyboard (see Keyboard on page 55)
   f. Remove the top cover (see Top cover on page 60)
   g. Remove the display assembly (see Display assembly on page 66)

Remove the Bluetooth module:

1. Position the computer right-side up, with the front toward you.
2. Lift the Bluetooth module **(1)** as far as the cable will allow.

3. Disconnect the Bluetooth module cable from the Bluetooth module **(2)** and remove the module.



Reverse this procedure to reassemble and install the Bluetooth module.

Latch assembly

NOTE: The Latch Kit includes the latch, bracket, two screws, and spring.

Description	Spare part number
Latch Kit	597837-001

Before removing the latch assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the WLAN module (see WLAN module on page 50)
   d. Remove the WWAN module (see WWAN module on page 53)
   e. Remove the keyboard (see Keyboard on page 55)

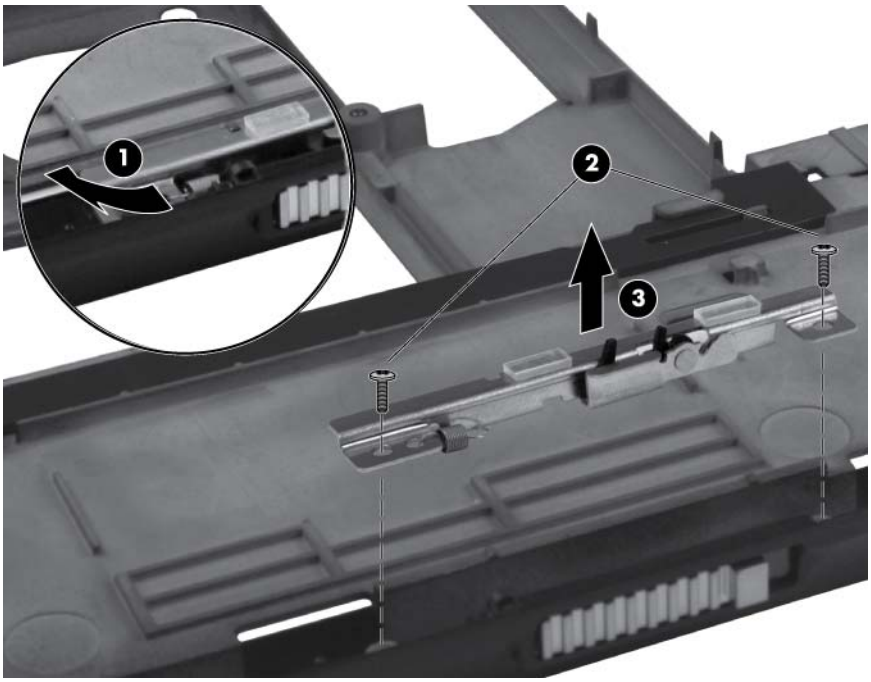
f. Remove the top cover (see Top cover on page 60)

g. Remove the display assembly (see Display assembly on page 66)

NOTE: The latch mechanism includes a small spring. Note the location of the spring.

Remove the latch assembly:

1. Position the computer right-side up, with the front toward you.
2. Detach the spring **(1)** from the latch.
3. Remove the two Phillips M2.0×4.0 screws **(2)** that secure the latch bracket to the base enclosure.
4. Lift the inner latch **(3)** from the computer.



Reverse this procedure to install the latch assembly.

Speaker assembly

Description	Spare part number
Speaker assembly	649767-001

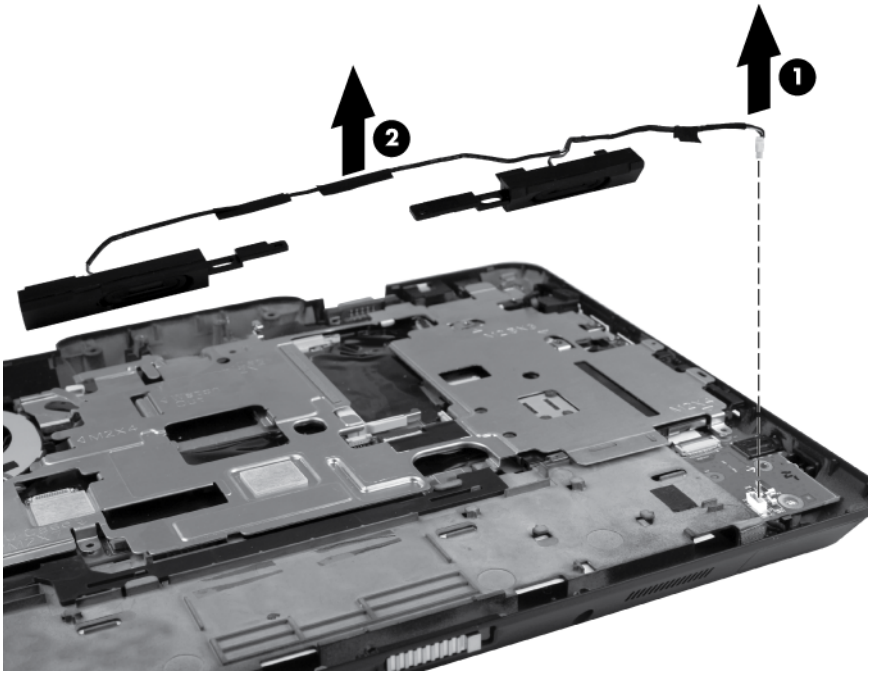
Before removing the speaker assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the WLAN module (see WLAN module on page 50)
   d. Remove the WWAN module (see WWAN module on page 53)
   e. Remove the keyboard (see Keyboard on page 55)
   f. Remove the top cover (see Top cover on page 60)
   g. Remove the display assembly (see Display assembly on page 66)
   h. Remove the Bluetooth module (see Bluetooth module on page 72)
   i. Latch assembly (see Latch assembly on page 73)

Remove the speaker assembly:

1. Position the computer right-side up, with the front toward you.
2. Unplug the speaker cable **(1)** from the audio connector board, and note the routing channel of the speaker cable in the base enclosure.
3. Slide the the speakers and cables **(2)** from the base enclosure and lift to remove.



Reverse this procedure to install the speaker assembly.

Audio board

Description	Spare part number
Audio connector board	649762-001

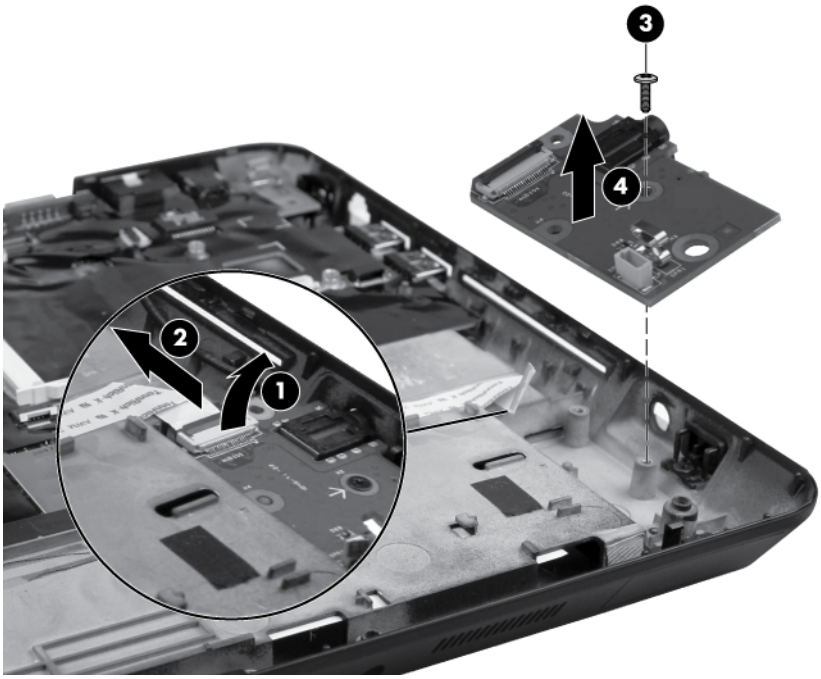
Before removing the audio connector board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the WLAN module (see WLAN module on page 50)
   d. Remove the WWAN module (see WWAN module on page 53)
   e. Remove the keyboard (see Keyboard on page 55)
   f. Remove the top cover (see Top cover on page 60)
   g. Remove the display assembly (see Display assembly on page 66)
   h. Remove the Bluetooth module (see Bluetooth module on page 72)
   i. Latch assembly (see Latch assembly on page 73)
   j. Remove the speaker assembly (see Speaker assembly on page 74)

Remove the audio connector board:

1. Position the computer right-side up, with the front toward you.
2. Release the ZIF connector **(1)** that secures the audio board cable to the system board and remove the audio board cable **(2)**.

3. Remove the Phillips M2.0×3.5 screw **(3)** that secures the audio connector board to the base enclosure and lift the board **(4)**.



Reverse this procedure to install the audio connector board.

Smart card reader

Description	Spare part number
Smart card reader	597839-001

Before removing the smart card reader, follow these steps:

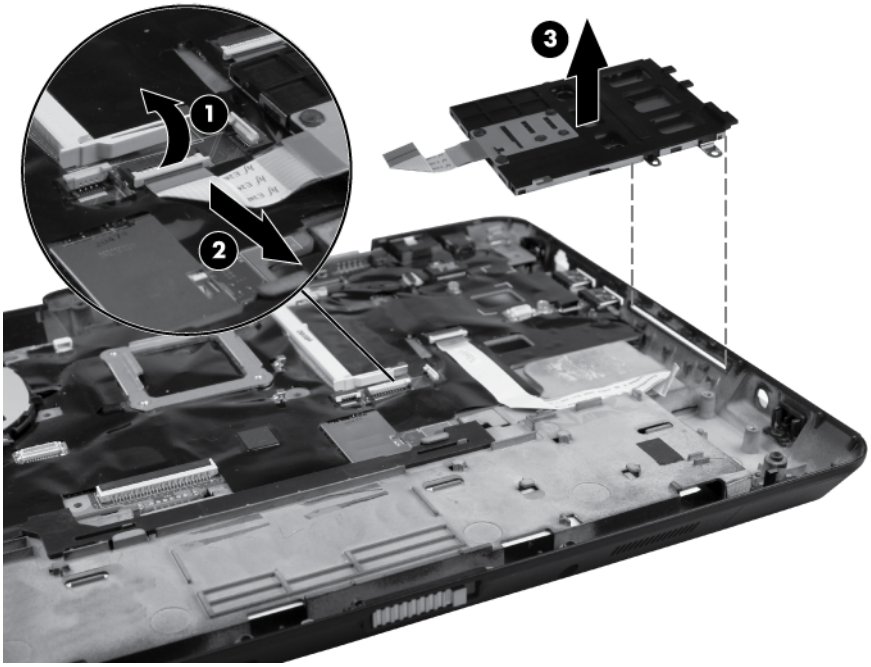
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the WLAN module (see WLAN module on page 50)
   d. Remove the WWAN module (see WWAN module on page 53)
   e. Remove the keyboard (see Keyboard on page 55)
   f. Remove the top cover (see Top cover on page 60)
   g. Remove the display assembly (see Display assembly on page 66)
   h. System board shield (see System board shield on page 69)

Remove the smart card reader:

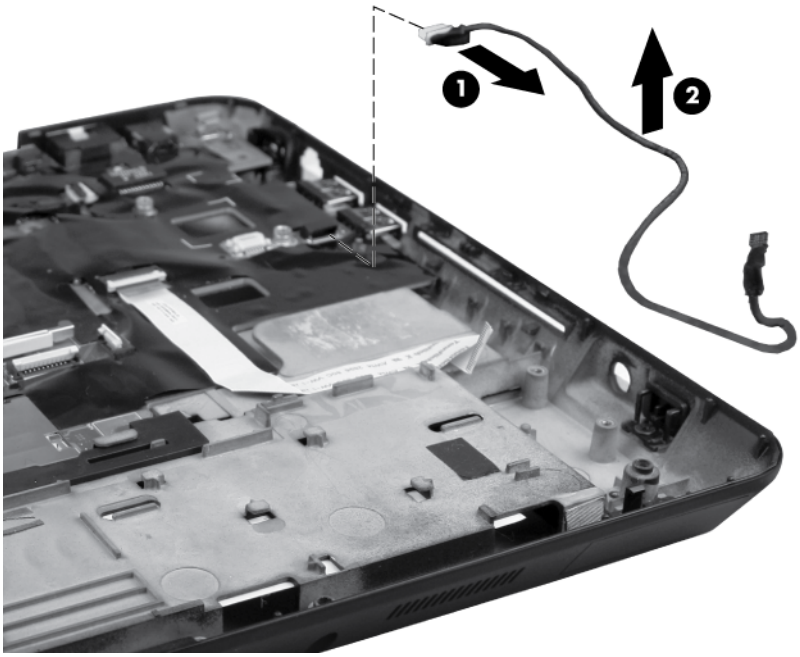
1. Position the computer right-side up, with the front toward you.
2. Disconnect the smart card reader cable from the ZIF connector **(1)** on the system board and remove the cable **(2)**.

3. Lift the smart card reader out of the chassis **(3)**.

NOTE: Adhesive secures the reader to the base enclosure. You must break the adhesion to remove the reader.



4. Remove the Bluetooth cable by disconnecting the ZIF cable **(1)** securing the Bluetooth module to the system board and thn lift the cable **(2)**.



Reverse this procedure to install the smart card reader.

System board

NOTE: The system board spare part kits include replacement thermal material.

Description	Spare part number
For use in all countries and regions except Russia and the People's Republic of China:	
• Equipped with Intel Core i7-2620M 2620M, 2.7 GHz (turbo up to 3.4 GHz) processor, 4 MB L3 cache, 35W	649748-001
• Equipped with Intel Core i5-2410M, 2.3 GHz (turbo up to 2.9 GHz) processor, 3 MB L3 cache, 35W (select models only)	649745-001
• Equipped with Intel Core i5-2520M, 2.5 GHz (turbo up to 3.2 GHz) processor, 3 MB L3 cache, 35W	649746-001
For use only in Russia and the People's Republic of China:	
• Equipped with Second Generation Intel Core i5-2410M Dual-Core processor [2.3 GHz (turbo up to 2.9 GHz), 3 MB L3 cache]	649749-001
• quipped with Second Generation Intel Core i5-2520M Dual-Core processor [2.5 GHz (turbo up to 3.2 GHz), 3 MB L3 cache]	649750-001
• Equipped with Second Generation Intel Core i5-2540M Dual-Core processor [2.6 GHz (turbo up to 3.3 GHz), 3 MB L3 cache]	649751-001
• Equipped with Second Generation Intel Core i7-2620M Dual-Core processor [2.7 GHz (turbo up to 3.4 GHz), 4 MB L3 cache]	649752-001

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the SIM card (see SIM on page 47)
   d. Remove the memory module (see Primary memory module on page 45)
   e. Remove the hard drive (see Hard drive on page 48)
   f. Remove the WLAN module (see WLAN module on page 50)
   g. Remove the WWAN module (see WWAN module on page 53)
   h. Remove the keyboard (see Keyboard on page 55)
   i. Remove the top cover (see Top cover on page 60)

j. Remove the RTC battery (see RTC battery on page 65)

k. Remove the display assembly (see Display assembly on page 66)

l. Remove the system board shield (see System board shield on page 69)

m. Remove the smart card reader (see Smart card reader on page 78)

When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

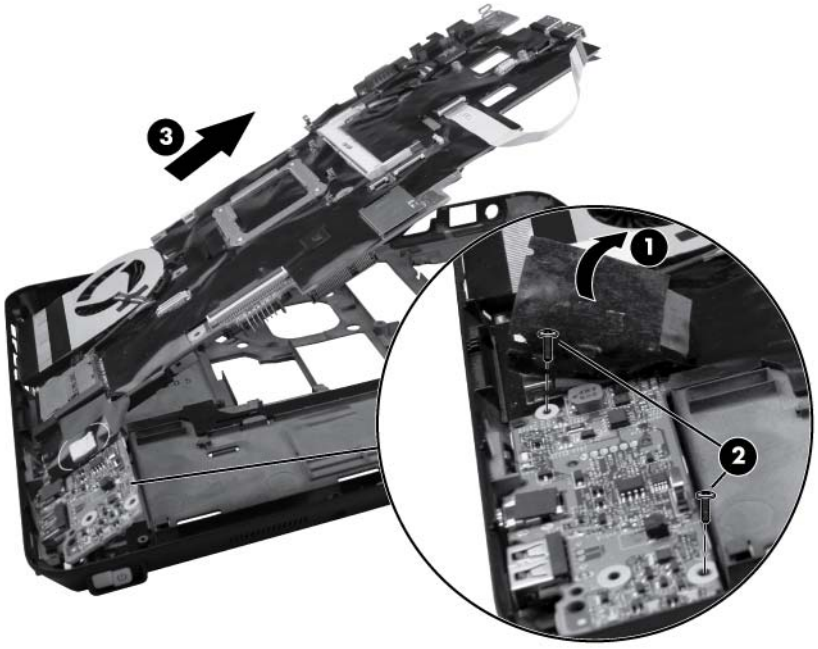
- Remove the SIM (see SIM on page 47)
- Remove the memory modules (see Primary memory module on page 45 and Secondary memory module on page 58)
- Remove the WLAN module (see WLAN module on page 50)
- Remove the WWAN module (see WWAN module on page 53)
- Remove the modem module (see Modem module on page 70)
- Remove the heat sink (see Fan/heat sink assembly on page 82)

Remove the system board:

1. Position the computer right-side up, with the front toward you.
2. Remove the ExpressCard or ExpressCard slot holder.

3. Peel back the adhesive strip **(2)** on the system board to reveal one of the two screws required to remove the system board.
4. Remove the two Phillips M2.0×4.0 screws **(2)** that secure the system board to the base enclosure.

5. Lift the right side of the system board, and remove it from the base enclosure **(3)**.



Reverse this procedure to install the system board.

Fan/heat sink assembly

The heat sink spare part kit includes replacement thermal material.

Description	Spare part number
Fan/heat sink assembly	649759-001

Before removing the fan/heat sink assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Remove the battery (see Battery on page 43)
   b. Remove the service access cover (see Service access cover on page 44)
   c. Remove the SIM card (see SIM on page 47)
   d. Remove the memory module (see Primary memory module on page 45)
   e. Remove the hard drive (see Hard drive on page 48)

f. Remove the WLAN module (see WLAN module on page 50)

g. Remove the WWAN module (see WWAN module on page 53)

h. Remove the keyboard (see Keyboard on page 55)

i. Remove the top cover (see Top cover on page 60)

j. Remove the RTC battery (see RTC battery on page 65)

k. Remove the display assembly (see Display assembly on page 66)

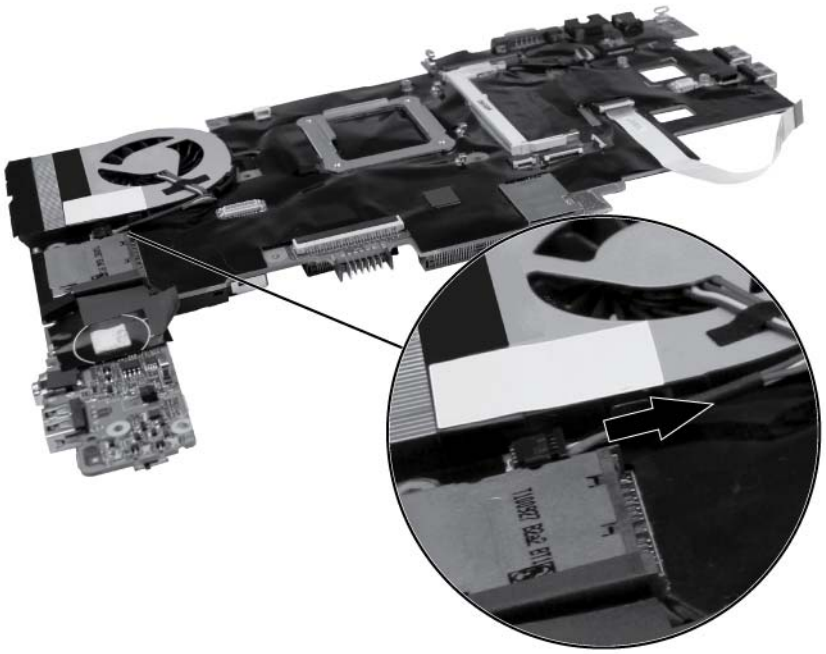
l. Remove the system board shield (see System board shield on page 69)

m. Remove the smart card reader (see Smart card reader on page 78)

n. Remove the system board (see System board on page 80)

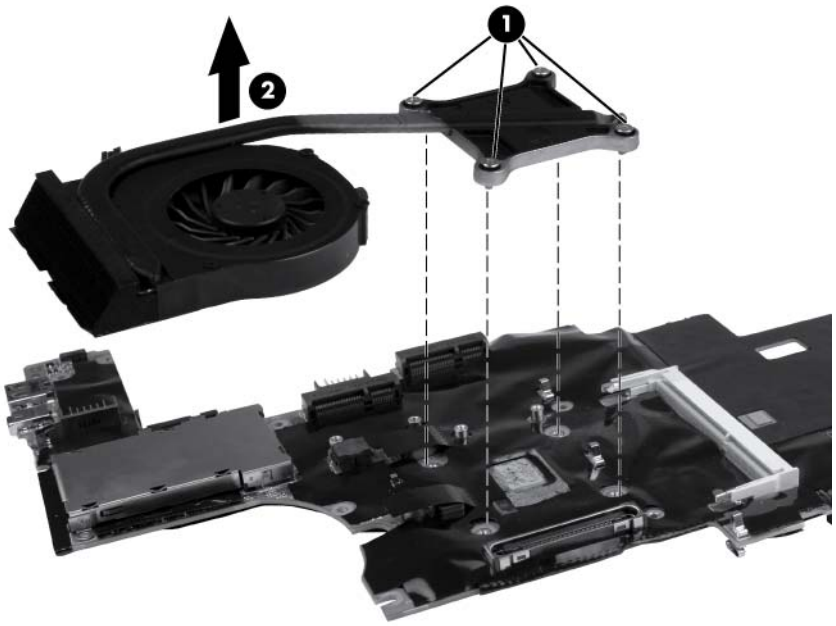
Remove the fan/heat sink assembly:

1. Position the system board right side up.
2. Disconnect the fan cable from the system board.

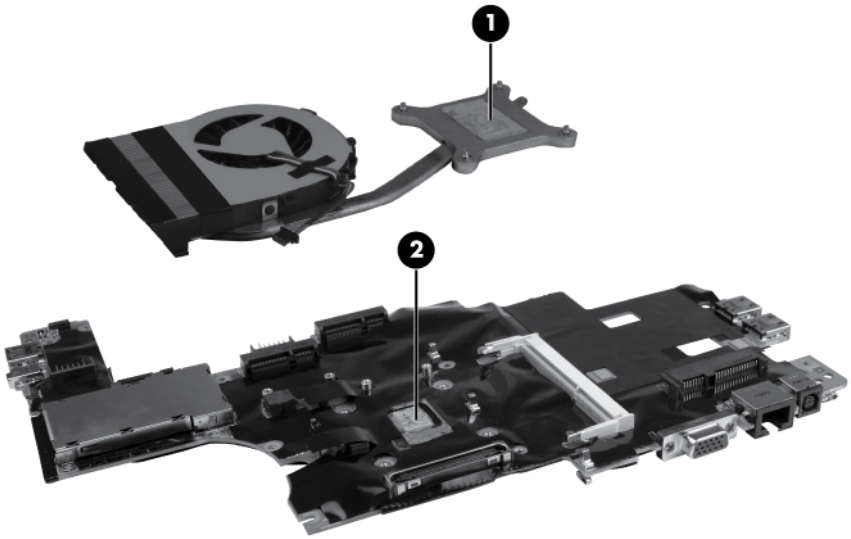


3. Position the system board upside down.
4. In the order indicated on the heat sink, loosen the four Phillips captive screws **(1)** that secure the heat sink to the base enclosure.

5. Remove the fan/heat sink assembly **(2)**.



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink **(1)** and processor **(2)** each time the heat sink is removed. Thermal material is included with fan/heat sink assembly and system board spare part kits.



Reverse this procedure to install the fan/heat sink assembly.

5 Computer Setup

Starting Computer Setup

Computer Setup is a preinstalled, ROM-based utility that can be used even when the operating system is not working or will not load.

NOTE: Some of the Computer Setup menu items listed in this guide may not be supported by your computer.

NOTE: An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
2. Press f10 to enter BIOS Setup.

Using Computer Setup

Navigating and selecting in Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, and System Configuration menus.

To navigate and select in Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
   - To select a menu or a menu item, use the tab key and the keyboard arrow keys, and then press enter, or use a pointing device to click the item.
   - To scroll up and down, click the up arrow or the down arrow on the right side of the screen, or use the up arrow key or the down arrow key.
   - To close open dialog boxes and return to the main Computer Setup screen, press esc, and then follow the on-screen instructions.

   NOTE: You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.
2. Press f10 to enter BIOS Setup.
3. Select the **File**, **Security**, or **System Configuration** menu.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes, click the **Exit** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

  – or –

  Use the tab key and the arrow keys to select **File > Ignore Changes and Exit**, and then press enter.

  – or –

- To save your changes and exit Computer Setup menus, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

  – or –

  Use the tab key and the arrow keys to select **File > Save Changes and Exit**, and then press enter.

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

NOTE: Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Turn on or restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
2. Press f10 to enter BIOS Setup.
3. Use a pointing device or the arrow keys to select **File > Restore Defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

   – or –

   Use the arrow keys to select **File > Save Changes and Exit**, and then press enter.

Your changes go into effect when the computer restarts.

NOTE: Your password settings and security settings are not changed when you restore the factory settings.

Computer Setup menus

The menu tables in this section provide an overview of Computer Setup options.

NOTE: Some of the Computer Setup menu items listed in this chapter may not be supported by your computer.

File menu

Select	To do this
System Information	• View identification information for the computer and the batteries in the system. • View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.
Set System Date and Time	Set or change the date and time on the computer.
System Diagnostics	Displays the following information: • System Information ◦ Identification information for the computer and the batteries in the system. ◦ Specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version. • Start-up Test—Verifies the system components needed for starting the computer. • Run-In Test—Runs a comprehensive check on system memory. • Hard Disk Test—Runs a comprehensive self-test on any hard drive in the system. • Memory Test—Runs a comprehensive test on any memory installed in the computer. • Battery Test—Runs a comprehensive test on any batteries installed in the computer. • Error Log—Displays a log file if any errors have occurred.
Restore Defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Hard drive mode, password settings, and security settings are not changed when you restore the factory settings.)
Reset BIOS security to factory default	Restore the BIOS security settings to the factory default.

Select	To do this
Ignore Changes and Exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save Changes and Exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

Security menu

NOTE: Some of the menu items listed in this section may not be supported by your computer.

Select	To do this
Setup BIOS Administrator Password	Set up a BIOS administrator password.
User Management > Create New BIOS User Account (requires a BIOS administrator password)	• Select from a list of BIOS users. • Select from a list of ProtectTools users.
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (enabled by default).
Always Prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (enabled by default).
Fingerprint Reset on Reboot (If Present)	Reset/clear the fingerprint reader ownership (select models only; disabled by default).
Change Password	Enter, change, or delete a BIOS administrator password.
HP SpareKey Enrollment	Enroll or reset HP SpareKey, which is a set of security questions and answers used if you forget your password.
Anti Theft > AT-p	Enable/disable Anti-Theft Protection.
DriveLock Password	• Enable/disable DriveLock on any computer hard drive (enabled by default). • Change a DriveLock user password or master password. **NOTE:** DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
Automatic DriveLock	Enable/disable Automatic DriveLock support.
TPM Embedded Security	Enable/disable support for Trusted Platform Module (TPM) Embedded Security, which protects the computer from unauthorized access to owner functions available in Embedded Security for ProtectTools. For more information, refer to the ProtectTools software Help. **NOTE:** You must have a setup password to change this setting.

Select	To do this
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive or the drive in the upgrade bay. **CAUTION:** If you run Disk Sanitizer, the data on the selected drive is destroyed permanently.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

System Configuration menu

NOTE: Some of the listed System Configuration options may not be supported by your computer.

Select	To do this
Language	Change the Computer Setup language.
Boot Options	• Set a startup menu delay (in seconds). • Set the MultiBoot Express popup delay (in seconds). • Enable/disable custom logo (disabled by default). • Enable/disable display diagnostic URL (enabled by default). • Enable/disable CD-ROM boot (enabled by default). • Enable/disable SD card boot (enabled by default). • Enable/disable floppy boot (enabled by default). • Enable/disable PXE internal NIC boot (enabled by default). • Enable/Disable Unified Extensible Firmware Interface (UEFI) Boot Mode (disabled by default). • Set the legacy boot order.
Device Configurations	• Enable/disable USB legacy support (enabled by default). When enabled, USB legacy support allows the following: ◦ Use of a USB keyboard in Computer Setup even when a Windows operating system is not running ◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer • Enable/disable fan always on while connected to an AC outlet (disabled by default). • Enable/disable Data Execution Prevention (select models only). When enabled, the processor can disable some virus code execution, which helps to improve computer security (disabled by default). • Select a SATA (Serial Advanced Technology Attachment) device mode. The following options are available: ◦ AHCI (Advanced Host Controller Interface) ◦ IDE (Integrated Drive Electronics) ◦ RAID (Redundant Array of Independent Disks) (select models only)

Select	To do this
	NOTE: Availability of these options varies by computer model. • Enable/disable secondary battery fast charge (enabled by default). • Enable/disable HP QuickLook (enabled by default). • Enable/disable preboot authentication on HP QuickLook boot (enabled by default). • Enable/disable HP QuickWeb (enabled by default). • Enable/disable HP QuickWeb write protect (disabled by default). • Enable/disable virtualization technology (select models only; disabled by default). • Enable/disable TXT (Intel Trusted Execution Technology) (select models only; disabled by default). • Enable/disable Multi Core CPU (enabled by default). • Enable/disable Intel HT Technology (enabled by default). • Enable/disable Wake on USB (enabled by default). • Enable/disable Num lock state at boot (disabled by default).

Select	To do this
Built-In Device Options	• Enable/disable the wireless button state (enabled by default). • Enable/disable embedded WWAN device radio (select models only; enabled by default). • Enable/disable embedded WLAN device radio (select models only; enabled by default). • Enable/disable the embedded Bluetooth device radio (enabled by default). • Enable/disable the network interface controller (enabled by default). • Enable/disable LAN/WLAN switching (disabled by default). • Set the wake on LAN state. Options include the following: ◦ Disabled ◦ Boot to Network ◦ Follow Boot Order • Enable/disable the ambient light sensor. • Enable/disable the fingerprint device (enabled by default). • Enable/disable the integrated camera (enabled by default). • Enable/disable the power monitor circuit (enabled by default). • Enable/disable the audio device (enabled by default). • Enable/disable a modem device (enabled by default). • Enable/disable the microphone (enabled by default). • Enable/disable the internal speakers (enabled by default).
Port Options	**NOTE:** All port options are enabled by default. • Enable/disable the flash media reader. • Enable/disable the USB port. **CAUTION:** Disabling the USB port also disables MultiBay devices and ExpressCard devices on the advanced port replicator. • Enable/disable the 1394 port. • Enable/disable the ExpressCard slot. • Enable/disable the Smart card slot. • Enable/disable the eSATA port.

Select	To do this
AMT Options	**NOTE:** All AMT options are disabled by default. • Enable/disable firmware verbosity. • Enable/disable AMT setup prompt (Ctrl-P). • Enable/disable USB key provisioning support. • Enable/disable unconfigure AMT on next boot. • Select terminal emulation mode: ◦ ANSI ◦ VT100 • Enable/disable firmware progress event support. • Enable/disable initiate Intel CIRA.
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Length	21.2 cm	8.35 in
Width	29.0 cm	11.4 in
Height (front to rear)	3.2 cm	1.27 in
Weight (equipped with 1 DIMM, 6-cell battery, WLAN module)	1.8 kg	3.97 lbs
Input power		
Operating voltage	18.5 V dc @ 3.5 A – 65 W	
Operating current	3.5 A	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	–50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	

NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.

30.7-cm (12.1-in), WXGA display specifications

	Metric	U.S.
Dimensions		
Height	16.3 cm	6.4 in
Width	26.1 cm	10.3 in
Diagonal	30.7 cm	12.1 in
Surface treatment	Anti-glare	
Number of colors	Up to 16.8 million	
Contrast ratio	400:1 (typical)	
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	0.204 mm	
Format	1280 × 800	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	4.0 W	
Viewing angle	±75° Horizontal, ±75° Vertical (minimum) ±80° Horizontal, ±80° Vertical (typical)	

Hard drive specifications

	128-GB*	160-GB*	250-GB*	320-GB*
Dimensions				
Height	7.0 mm	7.0 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm
Weight	75 g	78 g	115 g	115 g
Interface type	SATA Gen 2	SATA Gen 2	SATA	SATA
Transfer rate	100 MB/sec	100 MB/sec	300 MB/sec	300 MB/sec
Security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)				

	128-GB*	160-GB*	250-GB*	320-GB*
Single track	3 ms	3 ms	1.5 ms	1.5 ms
Average	13 ms	13 ms	11 ms	11 ms
Maximum	24 ms	24 ms	22 ms	22 ms
Logical blocks	250,069,680	312,581,808	488,397,168	625,142,448
Disc rotational speed	7200 rpm	7200 rpm	7200 rpm	7200 rpm
Operating temperature	5°C to 35°C	5°C to 35°C	5°C to 35°C	5°C to 35°C

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.

NOTE: Certain restrictions and exclusions apply. Contact technical support for details.

7 Backup and recovery

To protect your information, use Windows Backup and Restore to back up individual files and folders, back up your entire hard drive (select models only), create system repair discs (select models only), or create system restore points. In case of system failure, you can use the backup files to restore the contents of your computer.

Windows Backup and Restore provides the following options:

- Creating a system repair disc (select models only)
- Backing up individual files and folders
- Creating a system image (select models only)
- Scheduling automatic backups (select models only)
- Creating system restore points
- Recovering individual files
- Restoring the computer to a previous state
- Recovering information using recovery tools

NOTE: For detailed instructions, perform a search for these topics in Help and Support.

NOTE: In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create system repair discs (select models only) and your initial backup immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup. The system repair discs (select models only) are used to start up (boot) the computer and repair the operating system in case of system instability or failure. Your initial and subsequent backups allow you to restore your data and settings if a failure occurs.

You can back up your information to an optional external hard drive, a network drive, or discs.

Note the following when backing up:

- Store personal files in the Documents library, and back it up regularly.
- Back up templates that are stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

To create a screen shot:

1. Display the screen you want to save.
2. Copy the screen image:

   To copy only the active window, press alt+fn+prt.

   To copy the entire screen, press fn+prt sc.
3. Open a word-processing document, and then select **Edit > Paste**.

   The screen image is added to the document.
4. Save the document.

- When backing up to discs, use any of the following types of discs (purchased separately): CD-R, CD-RW, DVD+R, DVD+R DL, DVD-R, DVD-R DL, or DVD±RW. The discs you use will depend on the type of optical drive installed in your computer.

NOTE: DVDs and DVDs with double-layer (DL) support store more information than CDs, so using them for backup reduces the number of recovery discs required.

- When backing up to discs, number each disc before inserting it into the optical drive of the computer.

To create a backup using Backup and Restore, follow these steps:

NOTE: Be sure that the computer is connected to AC power before you start the backup process.

NOTE: The backup process may take over an hour, depending on file size and the speed of the computer.

1. Select **Start > All Programs > Maintenance > Backup and Restore**.
2. Follow the on-screen instructions to set up your backup, create a system image (select models only), or create a system repair disc (select models only).

NOTE: Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

Performing a recovery

In case of system failure or instability, the computer provides the following tools to recover your files:

- Windows recovery tools: You can use Windows Backup and Restore to recover information you have previously backed up. You can also use Windows Startup Repair to fix problems that might prevent Windows from starting correctly.
- f11 recovery tools: You can use the f11 recovery tools to recover your original hard drive image. The image includes the Windows operating system and software programs installed at the factory.

NOTE: If you are unable to boot (start up) your computer and you cannot use the system repair discs you previously created (select models only), you must purchase a Windows 7 operating system DVD to reboot the computer and repair the operating system. For additional information, refer to the "Using a Windows 7 operating system DVD (purchased separately)" section in this guide.

Using the Windows recovery tools

To recover information you previously backed up, follow these steps:

1. Select **Start > All Programs > Maintenance > Backup and Restore**.
2. Follow the on-screen instructions to recover your system settings, your computer (select models only), or your files.

NOTE: Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

To recover your information using Startup Repair, follow these steps:

CAUTION: Using Startup Repair completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process restores the operating system, as well as the drivers, software, and utilities, from the backup used for recovery.

1. If possible, back up all personal files.
2. If possible, check for the presence of the Windows partition and the HP Recovery partition.

   To check for the Windows partition, select **Start > Computer**.

   To check for the HP Recovery partition, select **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**.

   NOTE: If the Windows partition and the HP Recovery partition are not listed, you must recover your operating system and programs using the Windows 7 operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to the "Using a Windows 7 operating system DVD (purchased separately)" section in this guide.

3. If the Windows partition and the HP Recovery partition are listed, restart the computer, and then press f8 before the Windows operating system loads.
4. On the Advanced Boot Options screen, use the arrow keys to highlight **Repair your computer**, and then press enter.
5. Follow the on-screen instructions.

NOTE: For additional information on recovering information using the Windows tools, perform a search for these topics in Help and Support.

Using f11

CAUTION: Using f11 completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The f11 recovery tool reinstalls the operating system and HP programs and drivers that were installed at the factory. Software not installed at the factory must be reinstalled.

To recover the original hard drive image using f11, follow these steps:

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition: select **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**.

   NOTE: If the HP Recovery partition is not listed, you must recover your operating system and programs using the Windows 7 operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to the "Using a Windows 7 operating system DVD (purchased separately)" section in this guide.

3. If the HP Recovery partition is listed, restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
4. Press f11 to enter the HP Recovery menu.
5. Follow the on-screen instructions.

Using a Windows 7 operating system DVD (purchased separately)

If you are unable to boot (start up) your computer and you cannot use the system repair discs you previously created (select models only), you must purchase a Windows 7 operating system DVD to reboot the computer and repair the operating system. Make sure that your most recent backup (stored on discs or on an external drive) is easily accessible. To order a Windows 7 operating system DVD, go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions. You can also order the DVD by calling technical support. For contact information, refer to the *Worldwide Telephone Numbers* booklet included with the computer.

CAUTION: Using a Windows 7 operating system DVD completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as drivers, software, and utilities.

To initiate recovery using a Windows 7 operating system DVD, follow these steps:

NOTE: This process takes several minutes.

1. If possible, back up all personal files.
2. Restart the computer, and then insert the Windows 7 operating system DVD into the optical drive before the Windows operating system loads.
3. When prompted, press any keyboard key.
4. Follow the on-screen instructions.
5. Click **Next**.

6. Select **Repair your computer**.
7. Follow the on-screen instructions.

8 Power cord set requirements

The wide range input feature of the computer permits it to operate from any line voltage from 100 to 120 volts AC, or from 220 to 240 volts AC.

The 3-conductor power cord set included with the computer meets the requirements for use in the country or region where the equipment is purchased.

Power cord sets for use in other countries and regions must meet the requirements of the country or region where the computer is used.

Requirements for all countries and regions

The requirements listed below are applicable to all countries and regions:

- The length of the power cord set must be at least 1.5 m (5.0 ft) and no more than 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	METI	3
The Netherlands	KEMA	1
Norway	NEMKO	1

Country/region	Accredited agency	Applicable note number
The People's Republic of China	CCC	5
South Korea	EK	4
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
The United Kingdom	BSI	1
The United States	UL	2

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

9 Recycling

Battery

When a battery has reached the end of its useful life, do not dispose of the battery in general household waste. Follow the local laws and regulations in your area for computer battery disposal.

Display

WARNING! The backlight contains mercury. Caution must be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

CAUTION: The procedures in this chapter can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. When you remove these components, handle them carefully.

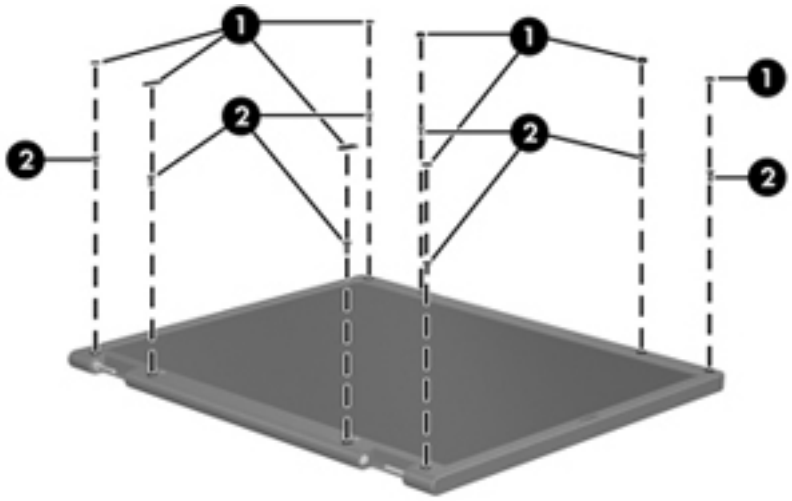
NOTE: Materials Disposal. This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities, or see the Electronic Industries Alliance (EIA) Web site at http://www.eiai.org.

This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.

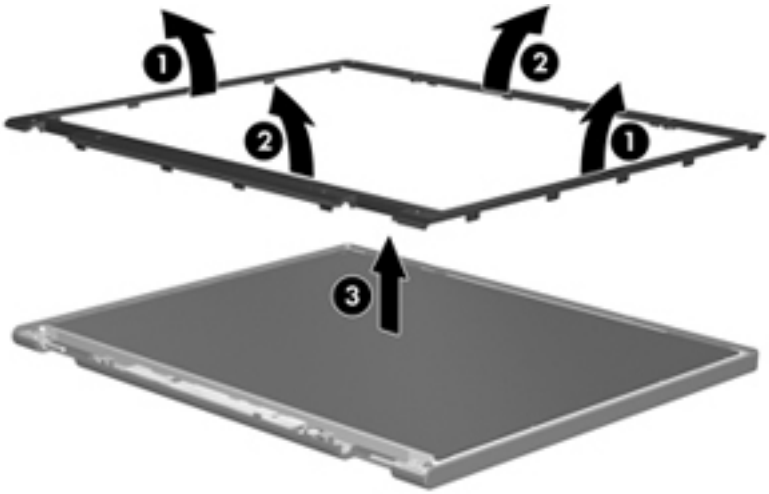
NOTE: The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps:

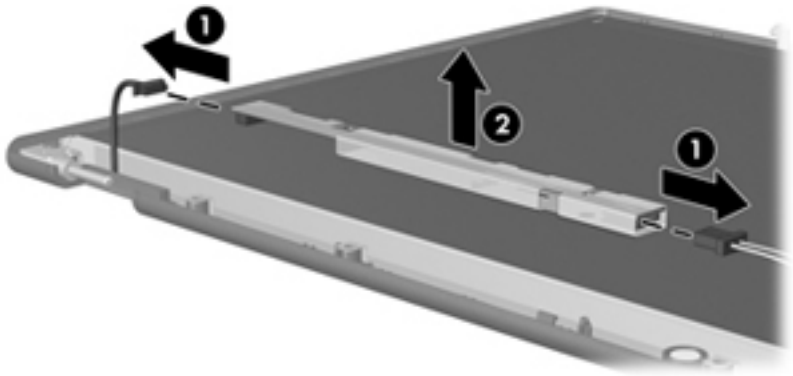
1. Remove the **(1)** and screws **(2)** that secure the display bezel to the display assembly.



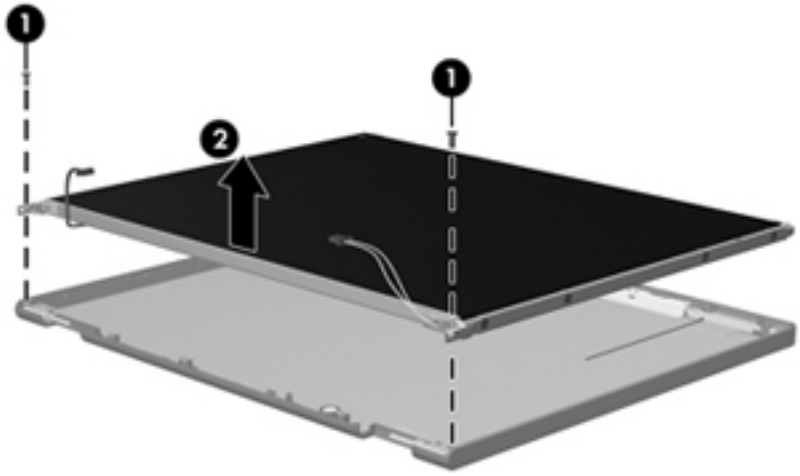
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel 3.



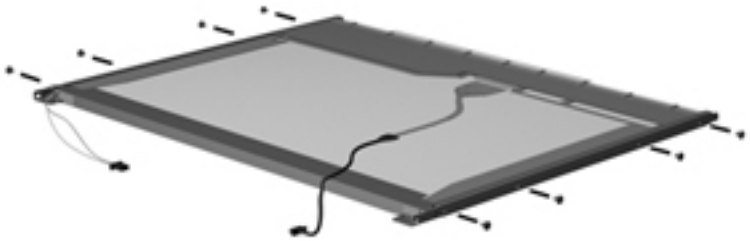
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter 2.



5. Remove all screws **(1)** that secure the display panel assembly to the display enclosure.
6. Remove the display panel assembly **(2)** from the display enclosure.

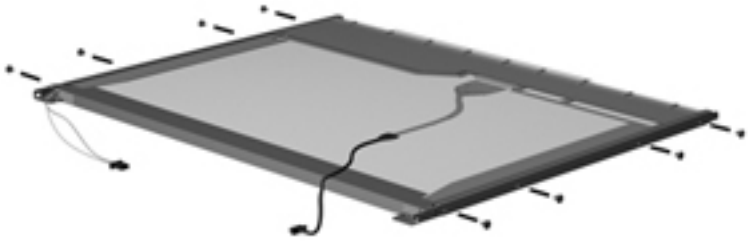


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

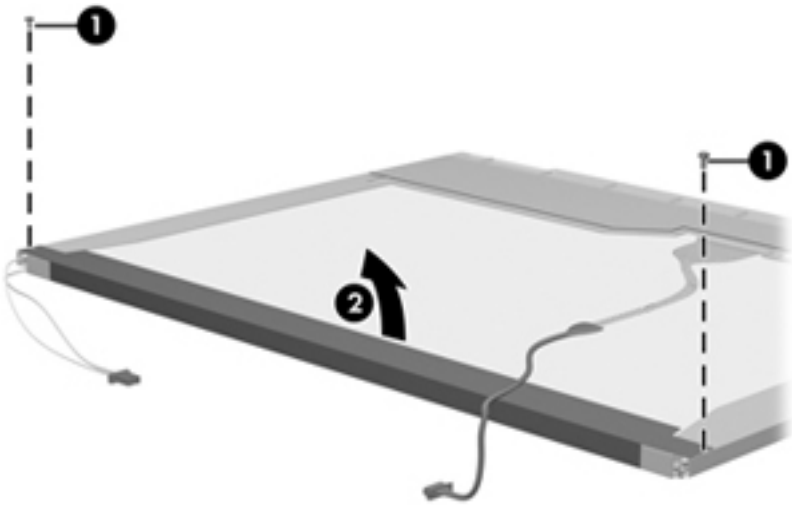


9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

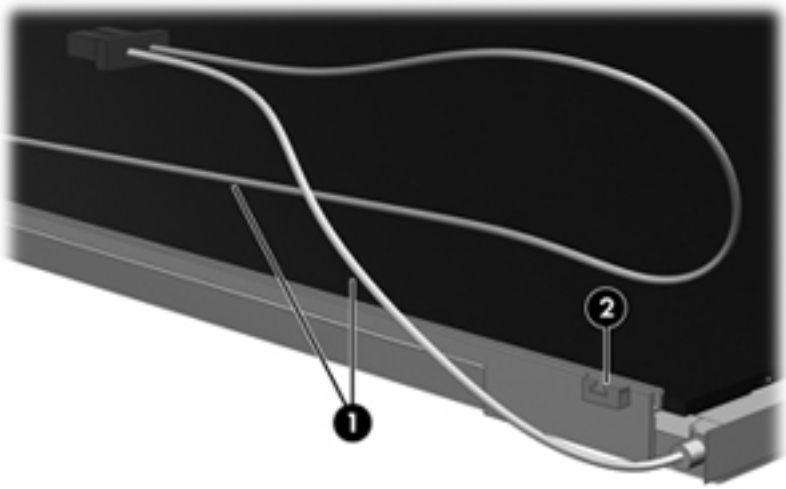
10. Remove the display panel frame **(2)** from the display panel.



11. Remove the screws **(1)** that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover **(2)** and swing it outward.

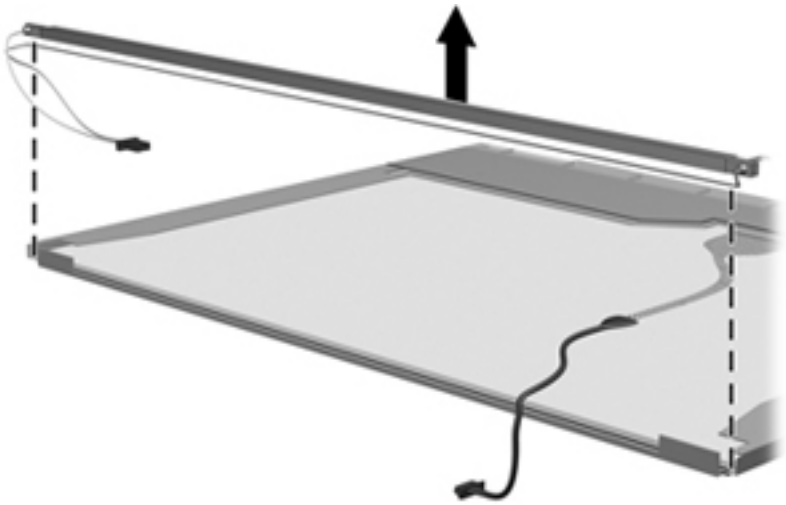


13. Remove the backlight cover.
14. Turn the display panel right-side up.
15. Remove the backlight cables **(1)** from the clip **(2)** in the display panel.



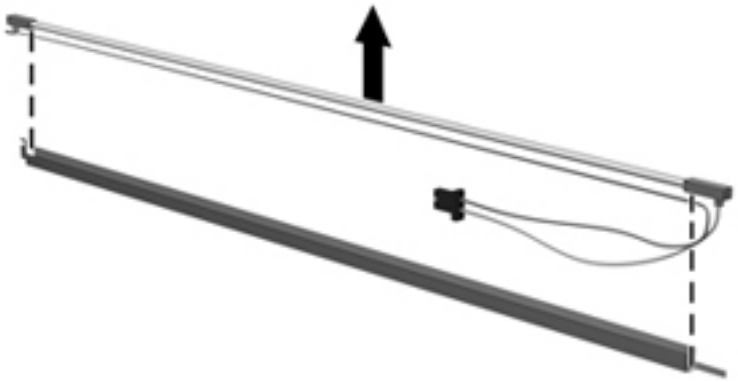
16. Turn the display panel upside down.

17. Remove the backlight frame from the display panel.



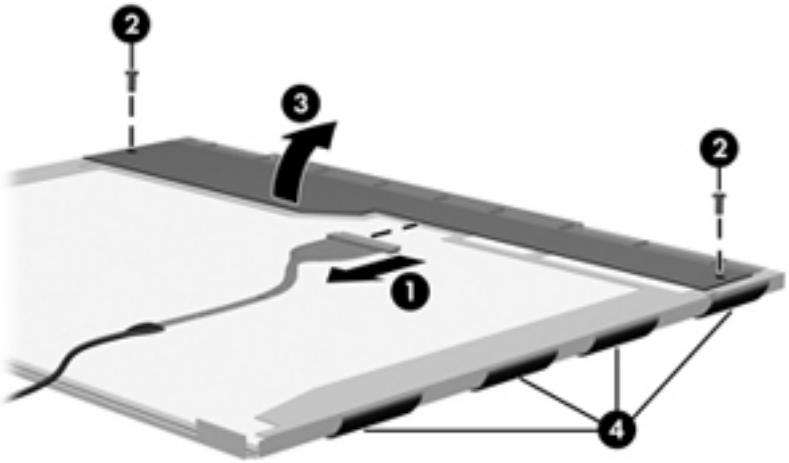
⚠ **WARNING!** The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

18. Remove the backlight from the backlight frame.

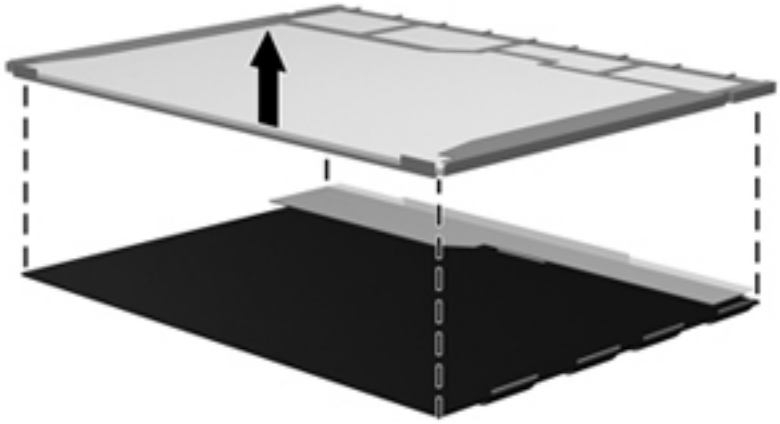


19. Disconnect the display cable **(1)** from the LCD panel.
20. Remove the screws **(2)** that secure the LCD panel to the display rear panel.
21. Release the LCD panel **(3)** from the display rear panel.

22. Release the tape **(4)** that secures the LCD panel to the display rear panel.



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

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